L 18570-65 EWT(d)/EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(v)/EWP(j)/T/EWP(l) Pc-4/Po-4/Pq-4/Pr-4/Pg-4/Ps-4/Pk-4/Pl-4 IJP(c)/AFETR/AFMDC/ESD(dp) WW/DJ/RM/BC

ACCESSION NR: AP5003104 S/0121/64/000/009/0006/0009

AUTHOR: Bron, L. S.

TITLE: Hermetic sealing of units for the hydraulic servos of machine tools and transfer machines

SOURCE: Stanki i instrument, n. 9, 1964, 6-9

TOPIC TAGS: hydraulic equipment, servosystem, rubber

Abstract: Internal leakages in hydraulic servosystems are a cause for instability of operation and changes in the time cycle of operation of the equipment. Among the factors which cause leaks are the structure of the packing, the finish quality of the surfaces being sealed, the materials used for sealing and the technology of their manufacture, the operating conditions of the equipment, the presence of oil cooling systems in the hydraulic tank, the viscosity characteristics of the oils, etc. Tests conducted in the laboratories of SKB-1 rubber showed that it is possible to reduce oil leakage considerably with proper design of the seals and fulfillment of technological requirements in manufacturing and installing them. Recommendations are given for selecting the optimum parameters of O-ring rubber seals. Orig. art. has [illegible]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, MT

NO REF SOV: 002 OTHER: 000 JPRS

Card 1/1

BRON, L.S.; LEBIN, D.A.

Optimum diameter of control valves in a hydraulic drive of automatic machine tools. Stan. i instr. 35 no.1:24-26 Ja '64.
(MIRA 17:3)

BRON, O. B., Prof, Dr. Tech Sci.

"Transient Conditions of an Induction Motor in Connection with the Operation of Alternating-Current Contactors."

Avtomatika i Telemekhanika, Vol 6, No. 3, 1941.

BRON, O.B.

110-10-11/18

AUTHOR: Bron, O.B., Doctor of Technical Sciences, Professor, and Rodshteyn, L.A., Engineer.

TITLE: The Frequency of Opening of Direct-current Contactors. (Chastota otklyucheniy kontaktorov postoyannogo toka.)

PERIODICAL: Vestnik Elektropromyshlennosti, 1957, Vol.28, No.10, pp. 52 - 59 (USSR)

ABSTRACT: By the use of closed-type arc-suppression chambers contactor equipment may be made much smaller. However, the opinion has often been expressed that apparatus of this kind can only be used when the frequency of operation is low. This opinion is usually based on the idea that since all the arc energy has to be dissipated in the chamber it will probably get too hot. This article considers the question of heating of closed arcing chambers in direct current contactors and shows that equipment of this kind is suitable for many installations with severe operating conditions.

An expression is derived for the energy dissipated in the arc. It is shown that in order to determine this energy it is necessary to know the law of change of arc current with time. However, this function is difficult to determine and approximations have to be used. Current-time curves during arc suppression determined experimentally are given in Fig.1.

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The Frequency of Opening of Direct-current Contactors.

The dotted curves correspond to the recommended approximate relationship and are in good agreement with the experimental values. An expression is then derived for the energy dissipated in the arc which is found to be proportional to a certain numerical coefficient. Curves for this coefficient are given in Fig. 2, and it is shown that over an important part of the range the factor changes very little and may be considered constant so that a simple expression is obtained for the current in the arc which is found to change in a linear manner with time.

The energy dissipated in an arc was determined experimentally. The circuit disconnected had an inductance of 11 mH and an initial current of 100 A whilst the voltage was changed from 50 to 500 V. The circuit was opened by a contactor type КП-203 with an open arc-suppression chamber. Oscillographic records were made on the current in the circuit and the voltage at the contactor terminals. The energy dissipated in the arc was determined from the oscillograms and calculated from the expression given in the paper. The time required to suppress the arc, which is necessary for the calculations, was determined experimentally, and is shown in Fig. 3a, whilst Fig. 3b gives the theoretical curve and experimental points. Agreement is good.

Card 2/6 The arc energy equation is derived for a circuit containing

The Frequency of Opening of Direct-current Contactors.

that can be used to control electric motors of the ПН series. In order to calculate the permissible frequency of opening it is assumed that the contactor works together with a motor which gives the greatest arc energy in the arc-suppression chamber permitted for the given contactor. The frequency of operation is then determined for a particular case and Table 2 shows the permissible number of operations per hour for contactors with closed arc-suppression chambers controlling electric motors of the ПН series. The rates vary from 3 000 to 8 000 operations per hour.

Experiments were made to establish the relationship between the temperature rise of arc suppression chambers and the frequency of operation. The tests were made with single pole contactors for currents of 25 and 100 A using closed arc-suppression chambers. The voltage was twice that which occurs on disconnecting the normally-loaded motor. The rated current of the contactor was opened at frequencies ranging from 600 to 4 800 per hour. Inductance was provided by air-cored reactors. The results are given in Fig. 5 and it will be seen that the experimental values are never greater than the calculated ones. Tests were then made with contactors of the KM-2000 series for 50 and 100 A. The contactors operated at 1.2 times rated current at

The Frequency of Opening of Direct-current Contactors.

inductance and resistance but is also applicable to the disconnection of a direct current motor. It can also be used without change to determine the energy on disconnecting a motor with retarded rotor. Brief analytical considerations show that the energy reaching the arc from the generator is considerably less when switching off a rotating motor than for a circuit containinductance and resistance with equal values of current and inductance.

The disconnection of a ПН type electric motor is then considered. Values of the inductance of four pole machines of the ПН series calculated from an expression given in the paper are presented in Table 1 which also gives the time constants and arc energy on disconnecting the motors when operating under full load. Graphs of the inductance of the armature circuits of motors of the ПН series are given in Fig. 4.

Calculations are then made of the permissible frequency of switching off using a contactor with closed arc suppression device.

An expression is derived for the temperature rise of the arc suppression chamber and, assuming a maximum permissible temperature rise, a limiting frequency of operation is determined. In Table 1, information is given about available types of contactors

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The Frequency of Opening of Direct-current Contactors.

116 V at the rate of 1 200 times an hour and the temperature of the chamber did not exceed 90 °C. Under these conditions, the contactors were operated up to 500 000 times without signs of damage. Fig. 6 shows various curves for permissible frequency of operation of a contactor type KP-203 for various operating conditions.

In the calculations it is assumed that the arc suppression chamber can operate at a temperature of 250 °C, which is permissible for asbestos cement and ceramics. If this temperature proves too high for other types of contactor the method of calculation can still be used to determine the permissible frequency of operation. Finally, it has been supposed that if contactors with closed chambers are operated at high-frequency, volatilised metal from the contacts will be deposited on the chamber walls. This effect was not observed even in a contactor operating 1 200 times an hour for half a million times.

It follows from the calculations and tests that contactors with closed chambers are suitable for many severe conditions of operation. The procedure of calculation that is given can be used to determine the permissible frequency of operation of contactors with sufficient accuracy for practical purposes.

Card 5/6 There are 6 figures, 2 tables and 5 Slavic references.

The Frequency of Opening of Direct-current Contactors. 110-10-11/18

ASSOCIATION: "Elektrosila" Works (Zavod "Elektrosila")
SUBMITTED: July 3, 1957.
AVAILABLE: Library of Congress
Card 6/6

BRON, O. B.

AID P - 2015

Subject : USSR/Electricity

Card 1/2 Pub. 27 - 19/31

Author : Ryazanov, G. A., Kand. of Phys. Math. Sci. Dotsent, Leningrad

Title : The field as an aspect of matter (Discussion of an article by O. B. Bron, this journal, no.7, 1954, & nos. 2 & 3, 1955)

Periodical : Elektrichestvo, 4, 78-79, Ap 1955

Abstract : The author thinks that O. B. Bron left certain basic problems unexplained and often used a confusing terminology. For example, he did not explain how to connect the "transformation" of the mass, energy, etc. occuring in the interaction of material objects with the idea of transformations of matter. This led him to such inaccurate expressions as that the field is transformed into heat. Heat is not matter, but only one of the forms of movement of matter, says the author, and points out some other inaccuracies of a similar nature.

AID P - 2015

Elektrichestvo, 4, 78-79, Ap 1955

Card 2/2 Pub. 27 - 19/31

Institution: None

Submitted : No date

AID P - 3037

Subject : USSR/Electricity

Card 1/2 Pub. 27 - 24/33

Author : Frolov, B. V., Kand. of Tech. Sci., Dotsent, Leningrad

Title : The field as an aspect of matter (Article by O. B. Bron, this journal, No. 7, 1954, Nos. 2, 3, and 4, 1955) (Discussion)

Periodical : Elektrichestvo, 7, 142-143, Jl 1955

Abstract : The author is concerned with the reviewers of O. B. Bron's article rather than with the article itself. He considers that discussion as most valuable from the scientific and philosophical points of view. This is a purely materialistic approach to the problem, and from that point of view, he criticizes certain statements of earlier participants in the discussion as smacking of 18th century idealism. In particular, he maintains that: 1) the mass exerts the same determining influence on the character of processes occuring in the electromagnetic field as does energy; 2) mechanical movement is not merely a change of place, but represents

Elektrichestvo, 7, 142-143, Jl 1955

Card 2/2 Pub. 27 - 24/33

a process associated with the transformation of certain forms of matter into other ones; 3) the law of conservation of the quantity of movement belongs to the universal laws, along with the laws of conservation of energy and of mass. These three groups of problems were differently interpreted in some of the discussions and are still misunderstood by some scientists as is evidenced in recent publications. This discussion should lead to a complete clarification of the problem. 10 Soviet references (1951-1955).

Institution : None

Submitted : No date

BRON, O. B.

The Field as a Form of Matter. Electrical Engineering, #5:166:May 55

SMIRNOV, G.P., kandidat tekhnicheskikh nauk, dotsent (Moskva); BRON, O.V., doktor tekhnicheskikh nauk, professor (Leningrad).

The field as a form of matter. Elektrichestvo no.2:71-72 F '56. (MLRA 9:5)

(Electromagnetic theory)

BRON, O.B., OKHRAZTSOV, V.A.

Automatic devices for magnetic field damping in large synchronous machines. Elektrosila no.14:44-51 '56. (MIRA 12:12)
(Electric machinery, Synchronous)

BRON, O.B.

105-7-8/29

AUTHOR: BRON, O.B., Prof. D. tech. sc., OBRAZTSOV, V.A., Engineer (Leningrad)

TITLE: Damping the Field in Synchronous Machines
(Gasheniye polya sinkhronnykh mashin. Russian)

PERIODICAL: Elektrichestvo, 1957, Nr 7, pp 34 - 38 (U.S.S.R.)

ABSTRACT: The results of the experiments carried out at the plant "Elektrosila" are given. The here described new system is based upon the application of a curved damping lattice. When damping, first the main contacts of the automaton open up and shortly afterwards the curved damping contacts. The arc produced at the contacts by the influence exercised by the outer transverse magnetic field is pressed into a space which is filled up by a curved damping lattice. The lattice divides the arc into a number of short arcs connected in series which burn as long as the current in the excitation winding has not dropped down to zero. There follows the description and the theoretical explanation of such an automatic device. Such an automatic device which was used at the hydraulic power plant of Kuybyshev can carry out 5 dampings in succession. Measurements on a 4,5 MVA synchron-generator showed that the time of damping amounted to 3,5 sec. by the application of a normal automatic device. The damping of the same field by means of the automatic device with the curved damping lattice took place after 0,39 sec.. The new automatic device, besides, had no molten contacts. (With 6 illustrations and 4 Slavic references).

Card 1/2

Damping the Field in Synchronous Machines 105-7-8/29

ASSOCIATION Not given
PRESENTED BY
SUBMITTED 22. 19. (?) 1956
AVAILABLE Library of Congress

Card 2/2

BRON, O.B.; BEL'KIND, L.D.; SHTURMAN, G.I.; KAMENEVA, V.A.; BERGER, A.Ya.; CHERNICHKIN, D.S.; TISHCHENKO, N.A.; BORISHKO, N.I.; BERTINOV, A.I.; SINEL'NIKOV, Ye.M.

Pavel Petrovich Kopniaev; 25th anniversary of his death. Elektrichestvo no.5:92 My '57. (MLRA 10:6)
(Kopniaev, Pavel Petrovich, 1867-1932)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES

13

TCP

Electric insulation [illegible] Kalinyanskii, [illegible] and [illegible] Russ. 53,110, July 31, 1938. An insulating compn. consists of Krasnodar petroleum bitumen with a penetration no. of 40-70 and a softening point of 90-100° (ball and ring).

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BRON, O.B.

29651

M.O. Dolivo-Dobrovol'skiy- ieobryetatyel'

iskrogasityel'noy Ryeshyetki

Elyektrichyestvo, 1949 no. 9 s. 71-73

SO: LETOPIS' NO. 40

"Motion of a High-Frequency Electric Arc in an Arc-Quenching Grating," Prof O. B. Bron, Dr Tech Sci, L. A. Gel'buh, Cand Tech Sci, Leningrad

"Elektrichestvo" No 9, pp 7-12

Discusses electrodynamic forces acting on a hf elec arc in an arc-quenching grating. Shows that effects arising in the quenching of a hf arc by a grating are essentially different from those occurring in the quenching of a dc or power-frequency

232T48

arc; imposing new requirements on the design of switching equipment for hf currents. Submitted 8 Dec 52.

232T48

BRON, O.B., doktor tekhnicheskikh nauk, professor (Leningrad).

M.O. Dolivo-Dobrovol'skii, inventor of the spark-extinguishing grid. Elektrichestvo no.5:77-79 My '53. (MLRA 6:6)
(Electric arc) (Dolivo-Dobrovol'skii, Mikhail Osipovich)

BRON, O.B.; KAZARNOVSKIY, D.M., redaktor; VORONETSKAYA, L.V., tekhnicheskiy redaktor

[Electric arc in control equipment] Elektricheskaia duga v apparatakh upravleniia. Moskva, Gos. energeticheskoe izd-vo, 1954. 532 p. [Microfilm]

(Electric arc) (Automatic control) (MLRA 8:2)

Subject : USSR/Electricity AID P - 439

Card 1/1 Pub. 27 - 2/34

Author : Bron, O. B., Prof., Dr. of Tech. Sci., Leningrad

Title : The Field as an Aspect of Matter

Periodical : Elektrichestvo, 7, 3-10, Jl 1954

Abstract : The author attempts to prove that the field (electric, magnetic, electromagnetic and gravitational) is a manifestation of matter. He rejects the concept of the field as space on the basis of the Marxian materialistic philosophy (Engels and Lenin are quoted). The author uses conventional equations and formulae of modern physics, and presents some applications of his new definition of the field.

Institution : None

Submitted : Ap 17, 1954

BRON, O. B.

AID P - 1465

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 16/36

Author : Rozanov, S. P., Doc. of Tech. Sci., Prof.

Title : The field as an aspect of matter (Discussion of the article by O. B. Bron, Elektrichestvo, No.7, 1954)

Periodical : Elektrichestvo, 2, 57-58, F 1955

Abstract : The author states that the problem is of utmost importance for electrical engineers since the concept of the field is confusingly presented in many different ways in the textbooks. However, the very scrupulous precision in definitions necessary in physics is not always as important in electrical engineering. Here approximations are often admissible. The author points out some abscurities in certain definitions.

Institution: Chair of Electrical Equipment of the M. I. Kh. M.

Submitted : No date

AID P - 1467

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 18/36

Author : Bron, O. B., Doc. of Tech. Sci., Prof., Leningrad

Title : The field as an aspect of matter (Discussion of the article by O. B. Bron, Elektrichestvo, No.7, 1954)

Periodical : Elektrichestvo, 2, 61-64, F 1955

Abstract : The author discusses all remarks, observations and criticisms published in Elektrichestvo, No.2, 1955, with the exception of those by V. M. Lavrov, to which he will return later. He states that motion changes the property of matter, and therefore electric, magnetic, and electromagnetic fields are three different aspects of matter. The author attempts to prove this statement. He disagrees with most of the other criticisms and explains his point of view.

Institution: None

Submitted : No date

8(2) PHASE I BOOK EXPLOITATION SOV/1556

Bron, O.B., Doctor of Technical Sciences, Professor

Nizkovol'tnyye elektricheskiye apparaty (Low-voltage Electrical Devices) Moscow, Izd-vo AN SSSR, 1958. 89 p. 1,500 copies printed.

Sponsoring Agencies: USSR Gosudarstvennyy nauchno-tekhnicheskiy komitet, and Akademiya nauk SSSR. Institut nauchnoy i tekhnicheskoy informatsii. Otdel nauchno-tekhnicheskoy informatsii. Sektor energeticheskoy promyshlennosti.

PURPOSE: This booklet is intended for those interested in low-voltage electrical equipment.

COVERAGE: The author examines the principal stages in the development of low-voltage equipment for electric drives in the Soviet Union during the last 40 years. He also discusses the state of current developments in electrical equipment both in the Soviet Union and abroad. The following plants are mentioned: "Ural Elektroapparat", "Krasnaya Zarya", "Proletariy", "Elektrosila", and KhEMS. No personalities are mentioned. There are 48 references, 41 of which are Soviet, 1 Czech, 3 English, and 3 German.

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Low-Voltage Electric Devices SOV/1556

TABLE OF CONTENTS:

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AVAILABLE: Library of Congress (TK453.B65)

JP/mas
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Soveshchaniye po elektricheskim kontaktam. Moscow. 1956.

Elektricheskiye kontakty; trudy soveshchaniya (Electrical Contacts; Transactions of the Conference) Moscow, Gosenergoizdat, 1958. 303 p. 4,150 copies printed.

Editorial board: B.S. Sotskov (Resp. Ed.), V.V. Usov, R.S. Kuznetsov, I.Ye. Dekabrun, and Z.S. Kirillova; Ed.: I.Ye. Dekabrun; Tech. Ed.: K.P. Voronin.

PURPOSE: This collection of articles is intended for engineers and technicians designing, developing and operating electrical apparatus and is concerned with electric contact materials. It may also be useful in scientific research institutes and laboratories.

COVERAGE: This book comprises reports delivered at the Electric Contacts Conference held in Moscow in November, 1956. These papers cover physical processes occurring during connecting or disconnecting, methods of designing and testing electric contacts, production and characteristics of contact materials. During this conference of the Institut avtomatiki telemekhaniki AN SSSR (Institute of Automation and Telemechanics, Academy of Sciences, USSR) participants approved periodic conferences of physicists, metallurgists, chemists and apparatus design specialists to discuss problems of electric contacts, which are the components of electric apparatus primarily influencing the reliability of electric systems, especially d-c control systems. Their physical, thermal, mechanical and chemical processes have still not been well analyzed. References are given at the end of most of the reports.

Afanas'yev, N.V. (Belorusskiy politekhnicheskiy institut - Belorussian Polytechnical Institute) Erosion of Electric Contact Materials 50
The author reports results of experimental investigation carried out by him at the Belorussian Polytechnical Institute on the influence of thermal characteristics of some metals on their ability to withstand erosion. He supplies tables which enable designers to make advance judgements of the erosion resistance of a material by knowing its thermal parameters.

Rasumikhin, M.A. Increasing the Erosion Resistance of Low-current Contacts in Automatic Apparatus 65
The author reports the results of experimental investigation of spark and arc or bridge erosion under operating conditions for various contact metals, air pressure and various gas mediums. He also discusses 5 quench circuits (spark discharge circuits) used under low-current conditions.

Fagin, A.I. (Institut metallurgii - Institute of Metallurgy, Academy of Sciences, USSR) Function of Electric Contact in the Process of Forming a Welded Joint 79
The author details his investigation of this problem. The total resistance in the welding process consists of the resistances of the two parts and the contact resistance. The latter is of great importance especially in the initial stage of welding process. The character of changes in the initial contact resistance as a function of the electrical and mechanical parameters of the welding process is demonstrated. The very wide changes in the initial resistance lead the author to conclude that this parameter is not suitable for evaluating the heat power determining the heating process in resistance welding.

II. DESIGN, APPLICATION AND TESTING METHODS 96

Sotskov, B.S. (Institute avtomatiki i telemekhaniki AN SSSR - Automation and Telemechanics Institute, Academy of Sciences, USSR) Problems in Designing Relay Contacts 96
The author explains theoretical fundamentals, and derives practical formulas for design and calculation of relay contacts for erosion-free, spark and arc conditions.

Bron, O.B. (Zavod "Elektrosila", Leningrad - Leningrad "Elektrosila" Plant) Operation Conditions of Contacts in Contactors and Automatic Circuit Breakers 111
The author discusses the basic problems relative to contactors, arc-suppression systems, and over-all dimensions. He describes operating conditions of contactors at switching-off and switching-on electric motors, the wearing away of contacts and methods of prolonging their life. Then he discusses the basic problems on automatic air circuit-breakers. Stages in their design are given. He explains abatement methods of eliminating electrodynamic repulsion of contacts, current-carrying links and liquid cooling of contacts.

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8 (3)

AUTHOR: Bron, O. B., Doctor of Technical Sciences, Professor (Leningrad) SOV/105-59-6-13/28

TITLE: Fault Currents in High-power Low Voltage Circuits (O tokakh korotkogo zamykaniya v moshchnykh nizkovol'tnykh setyakh)

PERIODICAL: Elektrichestvo, 1959, Nr 6, pp 60 - 63 (USSR)

ABSTRACT: This is a calculation of the fault currents in low-voltage circuits with the limitation, that the fault is arcless. Faults, which are caused by damage of the insulation, will not result in lasting contact faults, if currents are high. The electrodynamic forces produced at the fault location attempt to separate the connected current-carrying parts. If currents are high, these forces may reach an amount as to render an arcless fault impossible. The arc produced at the fault location extends rapidly and thus reduces fault currents by many times. Hence the design of circuits for such fault currents will give much too high fault currents. In order to arrive at correct results, the electrodynamical forces and the voltage drop across the arc which limits the fault current must be considered. In this paper, the results of calculations and experiments are presented. It appears that in high-power low-volt-

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age circuits a system of interlocking must be provided in order to prevent the occurrence of fault currents due to incorrect connections. This paper treats of the corrections becoming necessary in connection with the requirements placed upon low-voltage contactors in low-voltage circuits. There are 5 figures and 3 references, 2 of which are Soviet.

SUBMITTED: December 25, 1958

25(1)

SOV/105-59-8-27/28

AUTHORS: Bron, O. B., Professor, Doctor of Technical Sciences, Buylov, A. V., Engineer, Bulgakov, V. A. Docent

TITLE: P. V. Sakharov. Technology of Electric Apparatus Engineering. 2. Revised Edition. Part 1, 420 Pages, Price 7.85 Rubles, Gosenergoizdat Publishing House, 1956. Part 2, 408 Pages, Price 9.25 Rubles, Gosenergoizdat Publishing House, 1957

PERIODICAL: Elektrichestvo, 1959, Nr 8, p 96 (USSR)

ABSTRACT: The first edition of this book was published in 1950 and was the first publication on the technology of electric apparatus engineering in the USSR and abroad. It was compiled on the basis of data collected by the author during his activity in the Khar'kovskiy elektromekhanicheskiy zavod (Khar'kov Electromechanical Works), during his teaching activity at the MEI, where he has lectured on the "Technology of the Manufacture of Electric Apparatus" from 1939 till now, and during three stays in foreign countries. The book was translated into Chinese, Hungarian, Polish, Bulgarian and Czech. It treats not only of the technology but also of the fundamentals of apparatus designing of individual element groups and parts. The book

Card 1/2

P. V. Sakharov. Technology of Electric Apparatus Engineering. 2. Revised Edition. Part 1, 420 Pages, Price 7.85 Rubles, Gosenergoizdat Publishing House, 1956. Part 2, 408 Pages, Price 9.25 Rubles, Gosenergoizdat Publishing House, 1957

SOV/105-59-8-27/28

contains a systematic classification of the material on the technological processes of the manufacture of several thousand parts and element groups. An analysis of the solutions of designing and technological problems is included.

Card 2/2

BRON, O.B.

AUTHORS: Alekseyev, A. Ye., Atabekov, G. I., 105-58-6-29/33
Bron, O. B., Gorodskiy, D. A., Kostenko, M. P., Kurenev, S. I., Neyman, L. R., Polivanov, K. M., Reyngol'dt, Yu. A., Romanovskiy, V. B.

TITLE: Professor A.Ye. Kaplyanskiy (Professor A.Ye. Kaplyanskiy)

PERIODICAL: Elektrichestvo, 1958, Nr 6, pp. 92-92 (USSR)

ABSTRACT: On the occasion of his 60-th birthday. He was born on May 27, 1898. In 1925 Aleksandr Yevseyevich Kaplyanskiy, Doctor of Technical Sciences, Professor of the Leningrad Military-Air-Engineering Academy graduated from the Leningrad Institute for Electrical Engineering with a gold medal, then he worked in the factory "Krasnaya nit' " and later, until 1932, in the factory "Elektrosila". He planned and constructed the new system for the electric supply of the factory and a number of test stations, among them stations for asynchronous motors and turbogenerators up to 100 MW. In 1925 he began his pedagogical activity in the field of theoretical electrical engineering at the Leningrad Institute for Electrical Engineering. Later he also taught at the Institute for Electrical Engineering for Telecommunication En-

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Professor A.Ye. Kaplyanskiy

105-58-6-29/33

gineers, at the Institute for Railroad Engineers, at the Military-Air-Engineering-Academy, at the Institute for Water Transport Engineers. In these institutes he organized and directed the chairs for the theoretical principles of electrical engineering. - He wrote about 60 printed works. A number of his works are devoted to the theory of inverse and nonlinear circuits and to electromechanical analogies. In 1938 he took doctor's degree. He made many inventions in various fields of electrical engineering. He worked out universal alternating current apparatus which are used everywhere at present. In 1957 he edited a textbook "A Method of Teaching the Theoretical Principles of Electrical Engineering". In January 1958 the All Union Scientific Conference of Methods on the Theoretical Principles of Electrical Engineering was organized and carried out at his suggestion. There is 1 figure.

1. Electrical engineering--USSR 2. Scientific personnel--USSR

Card 2/2

AUTHORS: Bron, O. B., Professor, Doctor of Technical Sciences, Itenberg, D. S., Engineer (Leningrad) SOV/105-58-10-15/28

TITLE: Problems in Liquid Cooling of Electrical Apparatus (Problemy zhidkostnogo okhlazhdeniya elektricheskikh apparatov)

PERIODICAL: Elektrichestvo, 1958, Nr 10, pp 65 - 70 (USSR)

ABSTRACT: This is a presentation of experience gained in the "Elektrosila" Works. This experience is to the point that when comparing water cooling with air blast cooling the objections (Ref 1) raised against water cooling do not prove to be plausible. It is further demonstrated that the use of chemically pure water reduced leakage current to an insignificantly low level, which also is a fact speaking in favor of the use of water as a coolant. This is a description of high-frequency contactors and of automatic switchgears with water cooling. By employing hollow current carrying parts cooled by flowing water it was possible to reduce the dimensions and the consumption of non-ferrous

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metal. Water cooling of the stationary main contacts effects an increase of the current ratings. A noticeable feature of this system of automatic contactors is the circumstance that not only the apparatus itself but also the bus bars are water-cooled. Water cooling is highly effective in particular in group installations consisting of a number of contactors. There are 5 figures, 1 table, and 5 references, 4 of which are Soviet.

SUBMITTED: January 30, 1958

8(2)

AUTHORS: Bron, O. B., Professor, Doctor of Technical Sciences, Rodshteyn, L. A., Candidate of Technical Sciences SOV/105-58-12-3/28

TITLE: Electric Arcs in Longitudinal Slits (Elektricheskaya duga v prodol'nykh shchelyakh)

PERIODICAL: Elektrichestvo, 1958, Nr 12, pp 14 - 18 (USSR)

ABSTRACT: Electric arc extinction devices with narrow longitudinal slits are widely used in circuit breaking instruments for high and low voltage. Here, new processes having not yet been investigated are dealt with and the results having been formerly obtained were proved and generalized. First of all, the electric direct current arc was investigated. It moved along copper electrodes which were fastened between two sheets of asbestos cement. These sheets formed a narrow longitudinal slit. Investigations were carried out in the range of current strength from 100 to 2,500 A at a slit separation δ = 1 to 4 mm and a power of the magnetic field H = 1 to 2000 Oe. The interelectrode distance l was 15 and 30 mm. The measurement

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of the electric arc speed essentially proved the results having been formerly obtained (Refs 1,2). New values were found for the longitudinal gradient of the voltage in the pile of the electric arc. The longitudinal gradient of the electric voltage (of the electric arc in the longitudinal slit) depends only to a small extent on speed. This dependence is essentially stronger pronounced in an open arc. As the walls very often get glowing and start conducting the current, one cannot always assert that all the measured current passes the electric arc. (In order to obtain the characteristics of the immovable electric arc) two methods were applied and the results compared: 1) The method of extrapolation and 2) Immediate measuring of the current and of the voltage in the immovable electric arc, which was excited in a narrow longitudinal slit for a very short period. The results after these two methods showed approximatively the same values. The test data obtained were used in order to obtain a number of equations, connected with each other and passing into one another, static volt-ampere characteristics of the electric arc. The next task was the investigation of the electric arc in a slit with ribs. All the conditions were

the same as mentioned before. Only the form of the slit was different. The ribs and the enlargement of the slit turned out to have no influence on the speed of arc-movement. The speed remained the same as in flat parallel slits. The magnitude of the longitudinal gradient of the voltage proved to be dependent on the number of the ribs and on the form of the enlargement. All the curves for the slit with ribs were higher than those for slits with flat-parallel walls. The increase of the voltage on the pile of the arc in the slit with ribs seems to be connected with the intensification of the longitudinal gradient of the voltage in the section with cross-slits. It was established that the existence of slits increases the mean gradient in the pile of the electric arc with open slits by 40% to 60% and with closed slits by 30% to 40% when compared with the slits with flat-parallel walls. These investigations demonstrate certain advantages of the arc extinction chambers with slits with ribs in

Electric Arcs in Longitudinal Slits

relation to those with slits disposing of flat-parallel walls. There are 10 figures, 1 table, and 8 references, 7 of which are Soviet.

SUBMITTED: April 16, 1958

BRON, O.B.

Basic concepts of theoretical foundations of electrical engineering. Izv. vys. ucheb. zav.; elektromekh. 1 no.4:98-108 '58. (MIRA 11:8)

(Electric engineering)

Vsesoyuznoye ob"yedinennoye soveshchaniye po avtomatizatsii proizvodstvennykh protsessov v mashinostroyenii i avtomatizirovannomu elektroprivodu v promyshlennosti. 3d, Moscow, 1959

Elektroprivod i avtomatizatsiya promyshlennykh ustanovok; trudy soveshchaniya (Electric Drive and Automation in Industrial Systems; Transactions of the Conference) Moscow, Gosenergoizdat, 1960. 470 p. 11,000 copies printed.

General Eds.: I.I. Petrov, A.A. Sirotin, and M.G. Chilikin; Eds.: I.I. Sud, and E.F. Silayev; Tech. Eds.: K.P. Voronin, and G.Ye. Larionov.

PURPOSE: The collection of reports is intended for the scientific and technical personnel of scientific research institutes, plants and schools of higher education.

COVERAGE: The book is a collection of reports submitted by scientific workers at plants, scientific institutes and schools of higher education at the third Joint All-Union Conference on the Automation of Industrial Processes in Machine Building and Automated Electric Drives in Industry held in Moscow on May 12-16, 1959. The Conference was called by the Academy of Sciences USSR, the Gosplan SSSR (State Planning Commission USSR), the GNTK SSSR, the Gosudarstvennyy Komitet po avtomatizatsii i mashinostroyeniyu (State Committee on Automation and Machine Building) and the Natsional'nyy Komitet SSSR po avtomaticheskomu upravleniyu (USSR National Committee on Automatic Controls) and prepared by the Nauchno-tekhnicheskiy komitet po avtomatizirovannomu elektroprivodu (Scientific and Technical Committee on Automated Electric Drives), the MEI (Moscow Institute of Energetics), the VNIIEM, the IAT (Institute of Automation and Telemechanics) of the Academy of Sciences USSR, and the Komissiya po tekhnologii mashinostroyeniya Instituta mashinovedeniya AN SSSR (Commission on the Technology of Machine Building of the Institute of Science of Machines of the Academy of Sciences USSR). It was the purpose of the Editorial Board to arrange the reports in a way which would ensure a relatively systematic presentation of theoretical and practical problems relating to electric drives and automatic controls of industrial mechanisms used in various branches of industry. Basic problems of automated electric drive and their solution are outlined. The book also contains articles on electric machinery and means of automation. Considerable attention is paid to noncontact automatic control systems, including systems with semiconductor devices and magnetic amplifiers, and to computers intended both for the analysis and the synthesis of linear and nonlinear automatic regulation and control systems. Reports already published in journals or official publications have been considerably abbreviated; those which have appeared in volume V of NII EP transactions or in the journal "Elektrichestvo" are marked with an asterisk. No personalities are mentioned. References accompany some of the papers.

PART I. GENERAL PROBLEMS CONCERNING THE THEORY AND PRACTICE OF ELECTRIC DRIVE AND AUTOMATION OF CONTROL

BABAKOV, N.A.; BRON, O.B.; KORITSKIY, A.V.; SAKHAROV, P.V.; SOTSKOV, B.S.; STUPEL', F.A.; TSYPKIN, Ya.Z.

Seventieth anniversary of the birth of professor B.F.Vashura. Elektrichestvo no.9:96 S '60. (MIRA 13:10)
(Vashura, Boris Fedorovich, 1890-)

BRON, Osip Borisovich;OBRAZTSOV, V.A., red.; ZHITNIKOVA, O.S., tekhn. red.

[Automatic magnetic field quenching devices] Avtomaty gasheniia magnitnogo polia. Moskva, Gos. energ. izd-vo, 1961. 137 p. (Biblioteka po avtomatike, no.34) (MIRA 14:10)
(Magnetic fields) (Electric machinery)

BRON, Osip Borisovich; ORANSKIY, M.I., red.; ZHITNIKOVA, O.S., tekhn. red.

[The electromagnetic field as a form of energy] Elektromagnitnoe pole kak vid materii. Moskva, Gosenergoizdat, 1962. 259 p. (MIRA 15:9)

(Electromagnetic theory)

BRON, O.B., doktor tekhn.nauk

Thermal resistance of contacts. Vest.elektroprom. 33 no.4:61-62 Ap '62. (MIRA 15:4)

(Electric machinery)

ZALESSKIY, Aleksandr Mikhaylovich; BRON, O.B., prof., retsenzent;
KUKEKOV, G.A., red.; ZHITNIKOVA, O.S., tekhn. red.

[Electric arc in switching] Elektricheskaia duga otkliucheniia.
Moskva, Gosenergoizdat, 1963. 265 p. (MIRA 16:7)
(Electric arc) (Electric switchgear)

BRON, O.B., doktor tekhn. nauk, prof.; MYASNIKOVA, N.G., inzh.

Welding of electrical contactors during passage of large currents. Elektrotekhnika 34 no.10:41-47 O '63.
(MIRA 16:11)

BRON, O.B.

Transients in networks with an arc quenching grid. Elektrosila no.22:26-34 '63. (MIRA 17:1)

BRON, Osip Borisovich, doktor tekhn. nauk, prof.

Transient processes in networks containing arc-quenching coils. Izv. vys. ucheb. zav.; elektromekh. 6 no.4:485-505 '63. (MIRA 16:7)

1. Kafedra elektricheskikh mashin Severo-Zapadnogo zaochnogo politekhnicheskogo instituta.

(Transients (Electricity))
(Electric networks)
(Electric switchgear)

BRON, O.B., doktor tekhn.nauk; YEVSEYEV, M.Ye., inzh.

Silver contactors for increased temperatures and long-duration loads. Vest. elektroprom. 34 no.1:24-26 Ja '63. (MIRA 16:1)
(Electric contactors)

M. M.; MASLENNIKOV, D. S.; RUDNYY, V. M.

"Some Problems of Constructing High Power Circuit-Breakers."

report submitted for Intl Conf on Large Electric Systems, 20th Biennial Session, Paris, 1-10 Jun 64.

[illegible]; M. M.; MASLENNIKOV; RUDNYY, V. M.

"Some Problems of Constructing High Power Circuit-Breakers."

report submitted for 20th Biennial Sess, Intl Conf on Large Electric Systems, Paris, 1-10 Jun 64.

SEGAL', Apollon Moiseyevich; ERON, O.B., doktor tekhn. nauk, prof.; ORANSKIY, M.I., kand. tekhn. nauk, dots., retsenzent; SHNAREVICH, D.I., kand. tekhn. nauk, dots., retsenzent; VOL'PE, L., red.

[Electromagnetic field, Theoretical principles of electrical engineering] Elektromagnitnoe pole, TOE. Leningrad, Severo-Zapadnyi zaochnyi politekhn. in-t, 1964. 71 p.
(MIRA 18:11)

BRON, O.B., doktor tekhn. nauk, prof. (Leningrad)

Problems of the presentation of a course in "Theoretical principles of electrical engineering." Elektrichestvo no.9:88-89 S '64.
(MIRA 17:10)

BRON, O.B., doktor tekhn. nauk, prof.; YEVSEYEV, M.Ye., inzh.

Composite contactors subject to increased heat stress and load duration. Elektrotekhnika 35 no.9:47-49 S '64. (MIRA 17:11)

[redacted]

L 09939-67 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6021061 (A,N) SOURCE CODE: UR/0292/66/000/003/0045/0048

AUTHOR: Bron, O. B. (Doctor of technical sciences, Professor); Yevseyev, M. Ye. (Engineer)

ORG: none

TITLE: Permissible heating of silver and silver-containing contacts

SOURCE: Elektrotekhnika, no. 3, 1966, 45-48

TOPIC TAGS: electric device, silver ~~contact~~

ABSTRACT: Power-switching-equipment contacts made from silver and SOK-15 (Ag+15% CdO), SOM-10 (Ag+10% CuO), and SN-40 (Ag+Ni) compositions were tested (by various Soviet and Western researchers, e.g., H. Westhoff, T. H. Braunschweig, Dissertation, 1963) at temperatures up to 190C for 4000—6000 hrs continuously; some were tested under 12-hr-on 12-hr-off conditions for 4000 hrs

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at 195—200C. It was found that: (1) Both the silver-contact and composition-contact resistances considerably fall off with time and remain at their lowest values; (2) At temperatures as low as 200C, cold welding was observed in silver contacts. Based on the above experimental data, these recommendations are suggested for modifying Soviet GOST Standards: temperature rise (over 40C) for Ag and Ag-containing low-voltage contacts, 80C in air and 50C in oil; maximum temperature for the same contacts but operating at high voltages, 110—130C in air and 85—90C in oil depending on the contacts design. Orig. art. has: 10 figures and 2 tables.

SUB CODE: 09 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 004

Card 2/2

ANDRIANOVA, I.G., starshiy nauchnyy sotrudnik; BRON, O.B.; ZAKHAROVA, L.G.; PLASTOVA, N.F.; RUMYANTSEVA, T.B.

Data on the vitamin C saturation of the blood of donors living in various localities of the R.S.F.S.R. Akt.vop.perel.krovi no.4:21-23 '55. (MIRA 13:1)

1. Fiziko-khimicheskaya laboratoriya Leningradskogo instituta pereli-vaniya krovi (zav. laboratoriyey - prof. A.P. Vishnyakov).
(ASCORBIC ACID) (BLOOD)

VOROB'YEV, A.A.; BRON, O.B.; RODYAKINA, V.Ya.

Effectiveness of various programs for immunizing people with purified adsorbed tetanus anatoxin. Zhur.mikrobiol.epid. i immun. 27 no.7: 79-86 Jy '56. (MLRA 9:9)

1. Iz Voyenno-morskoy meditsinskoy akademii i Leningradskoy gorodskoy stantsii perelivaniya krovi.

(TETANUS, immunol. prev. and control
one-stage & repeated vacc. with purified adsorbed tetanus anatoxin)
(VACCINES AND VACCINATION
tetanus vacc., one-stage & repeated, with purified adsorbed tetanus anatoxin)

VOROB'YEV, A.A.; ASHKINAZI, L.I.; RODYAKINA, V.Ya.; RAFAL'SON, D.I.; ERON, O.B.

Change in the blood as an index of the general reaction of the organism to the administration of precipitated anatoxin. Zhur. mikrobiol.epid. i immun. 28 no.1:84-89 Ja '57. (MLRA 10:3)

1. Iz Leningradskoy gorodskoy stantsii perelivaniya krovi i Voyenno-morskoy meditsinskoy akademii.

(CLOSTRIDIUM TETANI,
toxin, eff. on blood (Rus))
(BLOOD,
eff. of Clostridium tetani toxin (Rus))

VOROB'YEV, A.A.; BACH, O.B.

Combined immunization of human subjects with purified sorbed tetanus anatoxin and tetravaccine. Zhur. mikrobiol.epid. i immun. 28 no.7:77-84 Jl '57. (MIRA 10:10)

1. Iz Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova i Leningradskoy gorodskoy stantsii perelivaniya krovi
(VACCINES AND VACCINATION,
typhoid-paratyphoid-dysenterial tetravvaccine & tetanus anatoxin simultaneous vacc. (Rus))
(TETANUS, prevention and control,
anatoxin, simultaneous vacc. with typhoid-paratyphoid-dysenterial tetravaccine (Rus))
(TYPHOID FEVER, prevention and control,
typhoid-paratyphoid-dysenterial tetravaccine, simultaneous vacc. with tetanus anatoxin (Rus))
(PARATYPHOID FEVERS, prevention and control,
same)
(DYSENTERY, BACILLARY, prevention and control
same)

VOROP'YEV, A.A.; BRON, O.B.

Comparative effectiveness of precipitated and native tetanus anatoxins in the revaccination of human subjects. Zhur. mikrobiol. epid. i immun. 29 no.10:117-121 O '58. MIRA 11:12)
(TETANUS, prev. & control,
revacc. with adsorbed & native anatoxins, comparison (Rus))

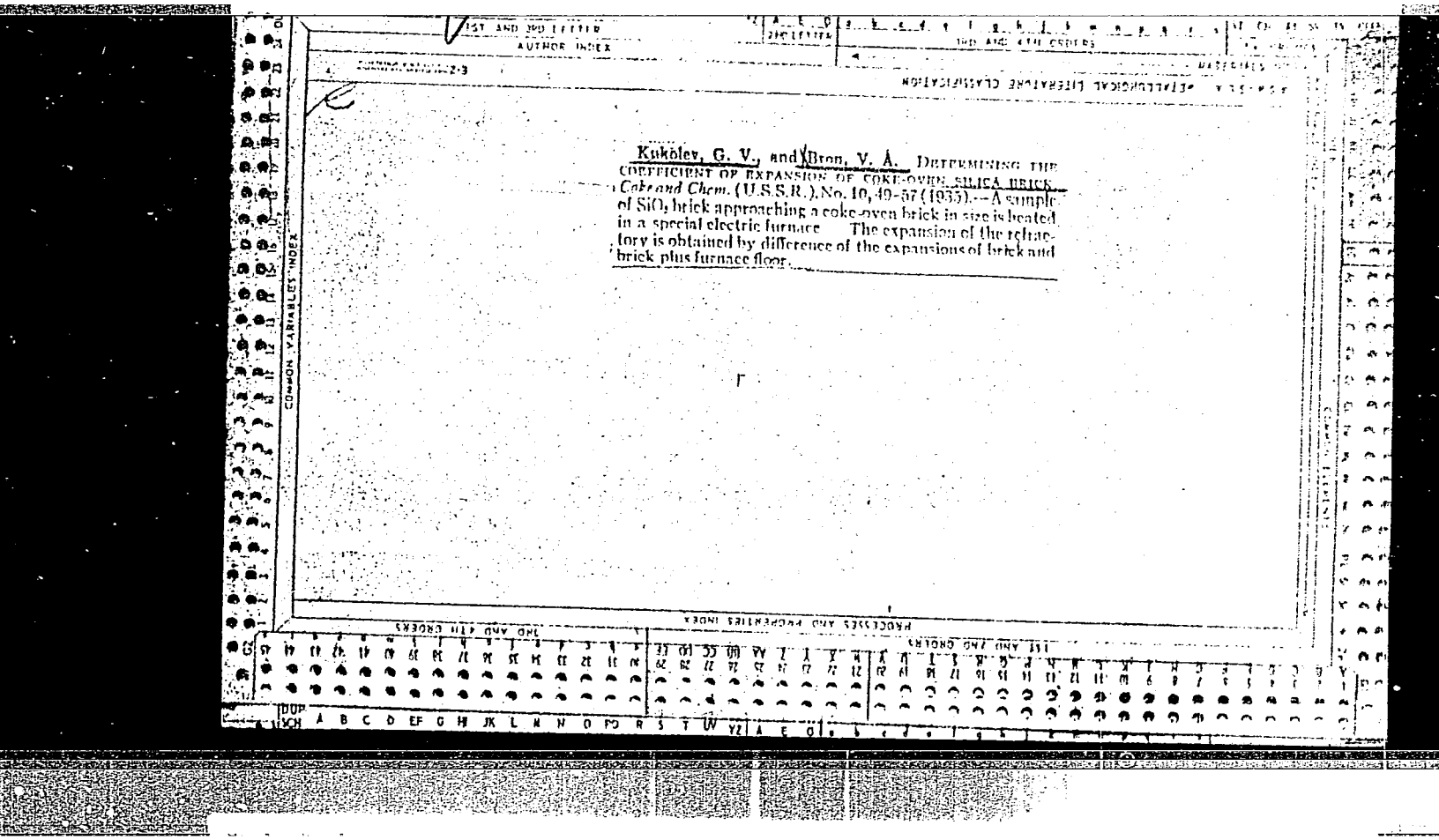
AYZENBERG, I.S.; ARONOVICH, I.S.; AFANAS'YEV, V.V.; BRON, O.B.; BUTKEVICH, G.V.; GOLUBEVA, V.P.; GURVICH, V.V.; ZALESSKIY, A.M.; ZAKHAROV, S.N.; KAPLAN, V.V.; KOCHENOVA, A.I.; KUKEKOV, G.A.; LYSOV, N.Ye.; MEDVED-SKIY, I.K.; MESSERMAN, G.T.; PETROVA, T.G.; FILIPPOV, Yu.A.; KHOLYAVSKIY, G.B.; SHERAUD, M.Ye.; SHKLYAR, B.N.

L.K. Greiner. Elektrotekhnika 35 no.2:p.3 of cover F '64.
(MIRA 17:3)

OSTROVSKIY, Ya.M. [Ostrovs'kyi, IA.M.]; SERDYUKOV, I.I.; KATS, Yu.M.; KOZACHUK, A.I.; TURZHANSKIY, Yu.V. [Turzhans'kyi, IU.V.]; SNIGUR, I.I. [Snihur,I.I.]; KIRILLOVSKIY, G.S. [Kyryllovs'kyi, H.S.]; BRON, S.S.; PESIS, Ye.I. [Pesis,E.I.]; SHUL'GA, A.M. [Shul'ha,A.M.]

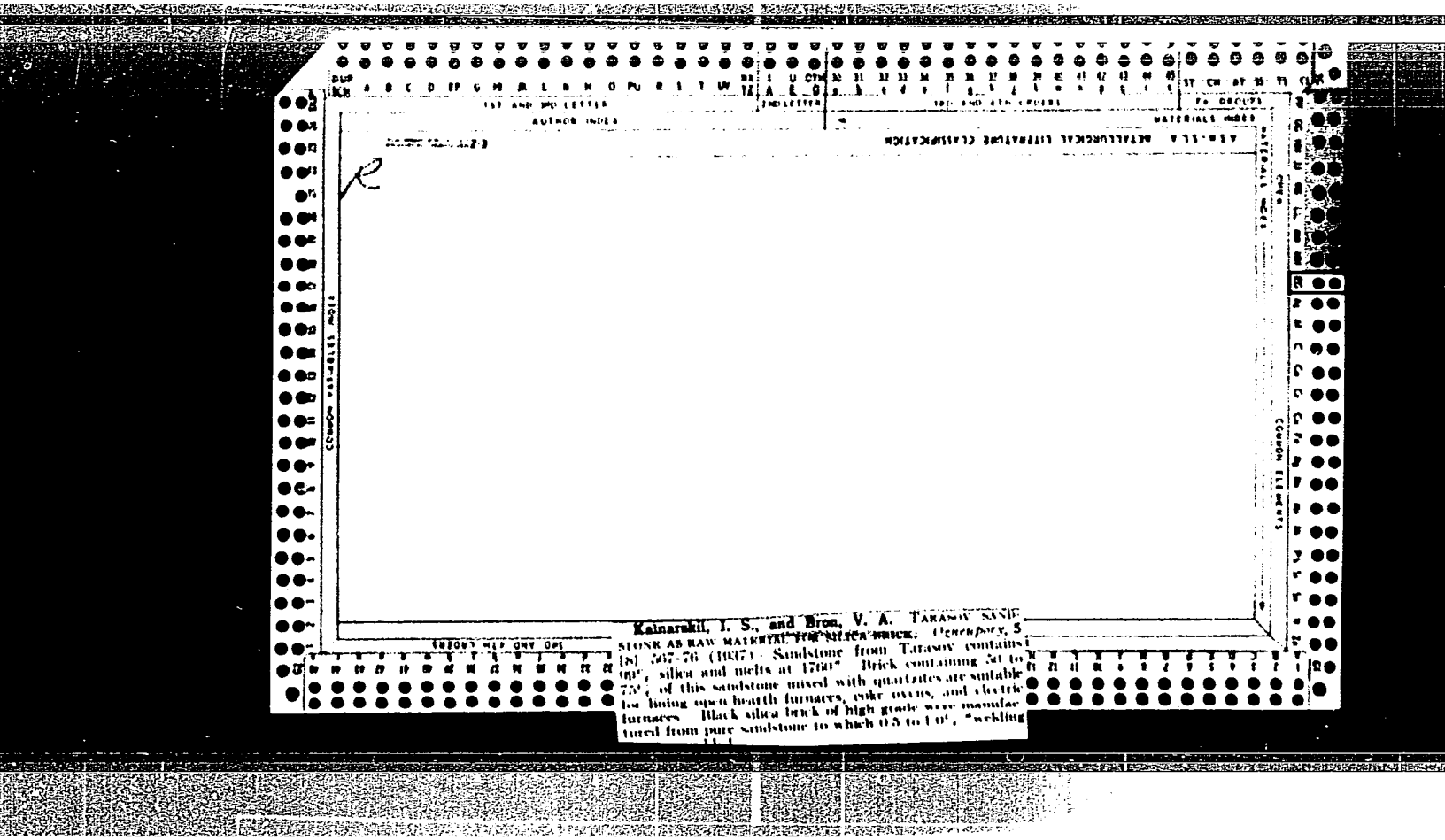
Proposals of efficiency promoters. Leh.prom. no. 4:81-88 O-D '63. (MIRA 17:5)

1. Khar'kovskaya obuvnaya fabrika (for Ostrovskiy, Serdyukov, Kats). 2. Zhitomirskaya obuvnaya fabrika (for Kozachuk, Turzhanskiy, Snigur). 3. Kiyevskaya obuvnaya fabrika No. 6 (for Kirillovskiy, Bron, Pesis, Shul'ga).

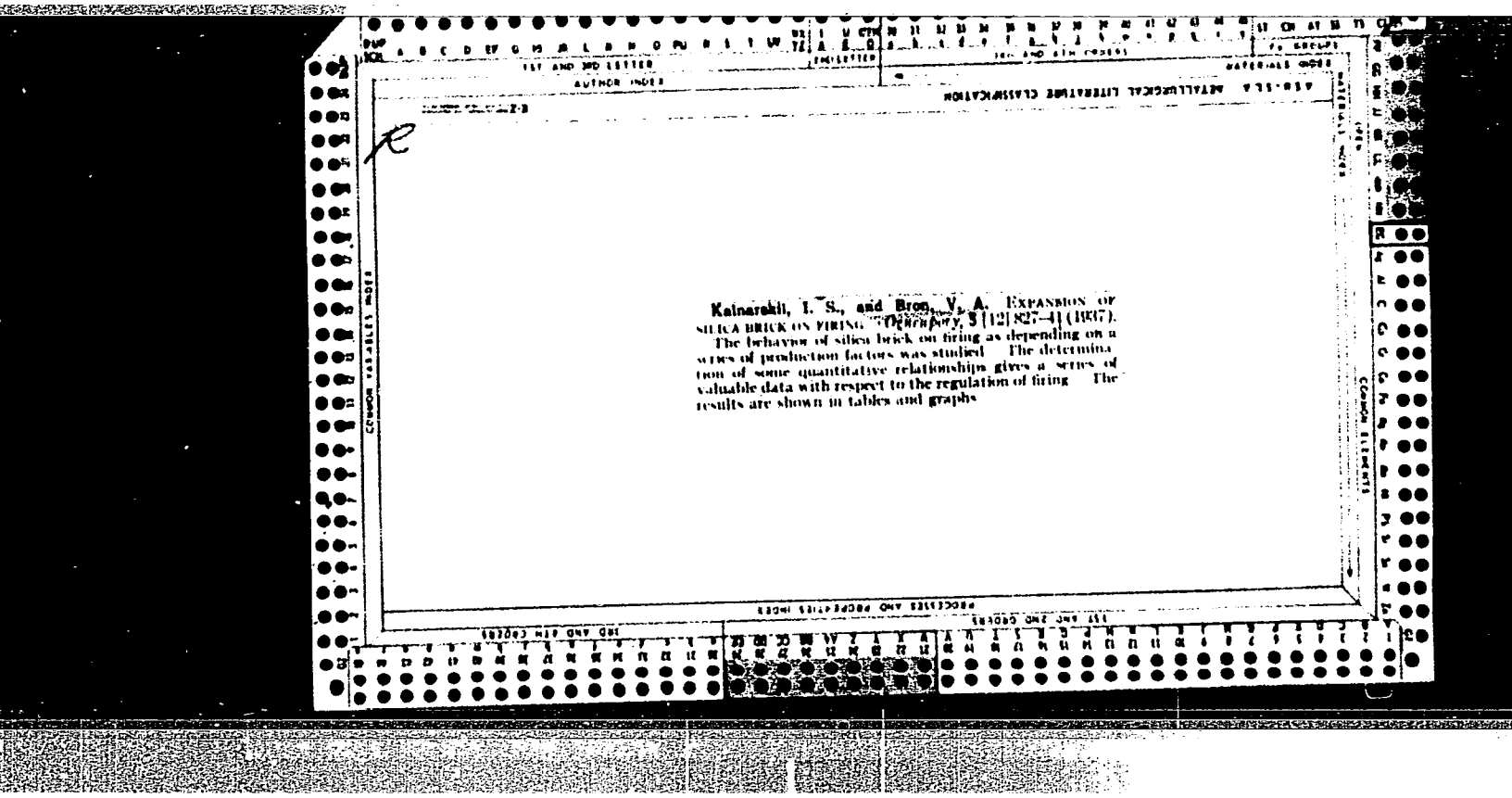


Kukolev, G. V., and Bron, V. A. Determining the coefficient of expansion of coke-oven silica brick. *Coke and Chem.* (U.S.S.R.), No. 10, 49-57 (1935).—A sample of SiO_2 brick approaching a coke-oven brick in size is heated in a special electric furnace. The expansion of the refractory is obtained by difference of the expansions of brick and brick plus furnace floor.

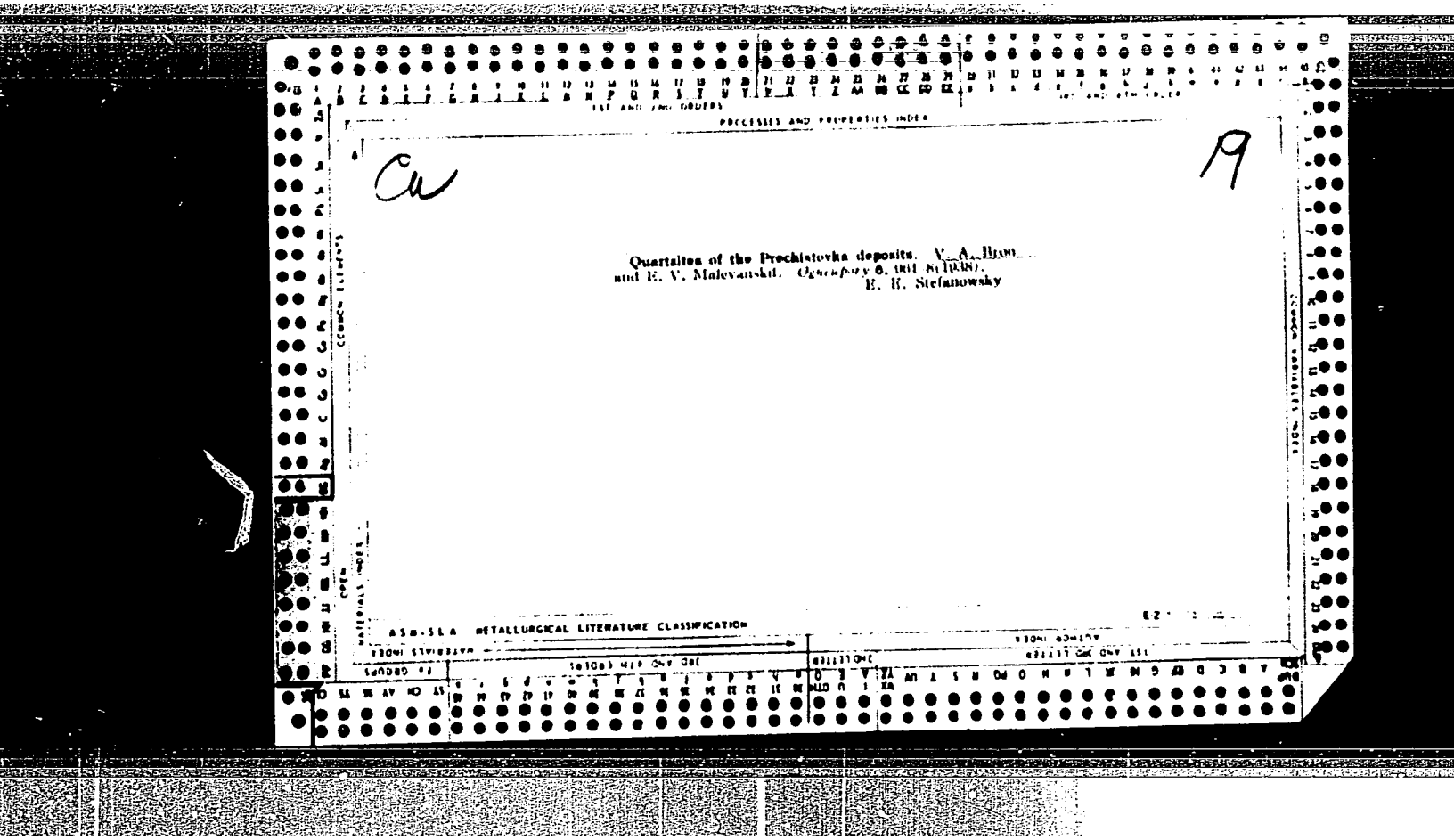
Kalnarskii, I. S., and Bron, V. A. MORTAR FOR COKE OVENS. (*Ukrain. Nauch.-Issledovatel. Ogneuporov i Kisloupornov*, No 30, 60 pp. (1936). -It was found that the introduction of clay (over 20%) into quartzite mixes affects the properties of the mix on firing. Their porosity is greatly lowered on firing to 1350°, their resistance to pressure is increased (when cold), and the volume diminished. The refractoriness of the mixes decreases with increased clay content and reaches cone 26 in mixes containing 40% clay. Mixes of quartzite, clay, and chalk sinter at 850° which allows mortars of different properties to be obtained by varying their ratio of components. The addition of water-glass decreased the sintering temperature without greatly decreasing refractoriness. The use of quartz sand instead of quartzite increased porosity and lowered adherence and expansion. The fine grinding of sand does not improve the mix. Crushed silica lowers expansion; mechanical strength and porosity are not affected by the amount of crushed silica introduced. The mixes sinter at 1350° when large amounts of silica and clay are introduced. Variation in grain size affects porosity and strength of fired mixes. Standard specifications for such mortars are given.

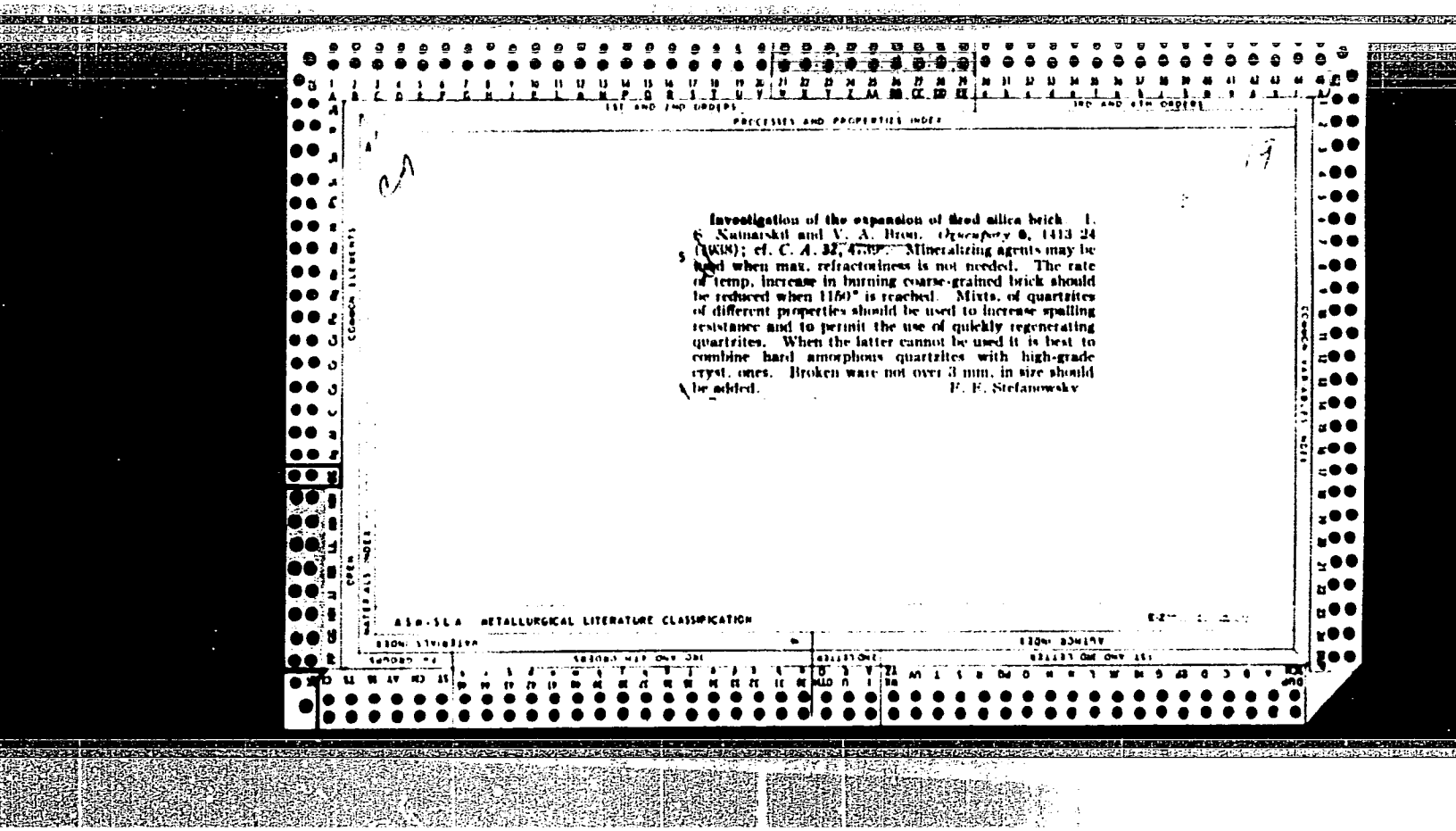


Kainarskii, I. S., and Brom, V. A. Tarasov sand-
stone as raw material for silica brick. *Ogneupory*, 5
[8] 367-76 (1937). Sandstone from Tarasov contains
98%, silica and melts at 1760°. Brick containing 50 to
75% of this sandstone mixed with quartzites are suitable
for lining open hearth furnaces, coke ovens, and electric
furnaces. Black silica brick of high grade ware manufac-
tured from pure sandstone to which 0.5 to 1.0%, "weakling



Kainarskii, I. S., and Bron, V. A. EXPANSION OF SILICA BRICK ON FIRING. *Ogneupory*, 3 [12] 827–41 (1937).
The behavior of silica brick on firing as depending on a series of production factors was studied. The determination of some quantitative relationships gives a series of valuable data with respect to the regulation of firing. The results are shown in tables and graphs.



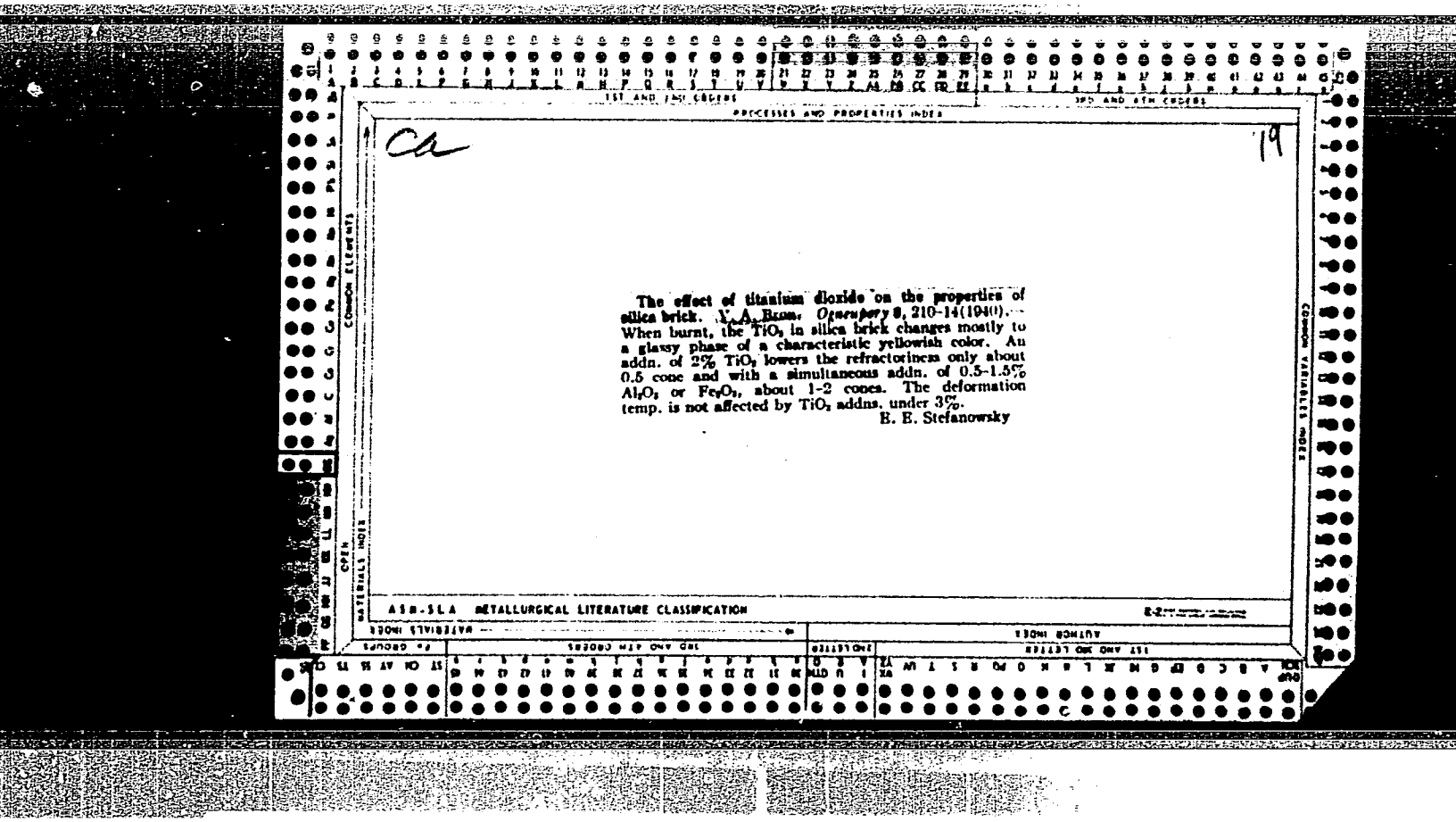


Investigation of the expansion of fired silica brick. I. S. Naimarkii and V. A. Brun. *Ogneupory* 6, 1413-24 (1938); cf. *C. A.* 32, 4539[illegible]. Mineralizing agents may be used when max. refractoriness is not needed. The rate of temp. increase in burning coarse-grained brick should be reduced when 1160° is reached. Mixts. of quartzites of different properties should be used to increase spalling resistance and to permit the use of quickly regenerating quartzites. When the latter cannot be used it is best to combine hard amorphous quartzites with high-grade cryst. ones. Broken ware not over 3 mm. in size should be added. P. F. Stefanowsky

BRON, V. A.

Bron, V. A. METHODS FOR THE QUALITATIVE EVALUATION OF SILICATES AS RAW MATERIALS FOR THE PRODUCTION OF DINAS STONE. *Soviet Geol.*, 6 [10] [1936] 21-27 [in Russian]. The method of the Ukrainian Institute for Scientific Research of Refractory and Acid-Resisting Materials consists of determinations of surface impurities, macro- and microstructure, specific gravity, volume weight and porosity before and after firing, adsorptive capacity for H_2O, and determination of Al_2O_3 and Fe_2O_3 in all cases and of CaO and TiO_2 in certain cases.

Bron, V. A. HOT REPAIR OF COKE OVENS. *Ukrain. Nauch.-Issledovatel. Inst. Ogneuporov i Kislotouporov*, 1939 [45] 58–72.—Attempts to produce suitable mixes for the hot repair of coke ovens are discussed. The most suitable mix was composed of natural dust-like quartz rock (marshalite) as a basic component and additions of 20% finely ground quartz, 5% Chasov-Yar clay, 1.0 to 1.5% graphite, and 1.25% soluble glass.



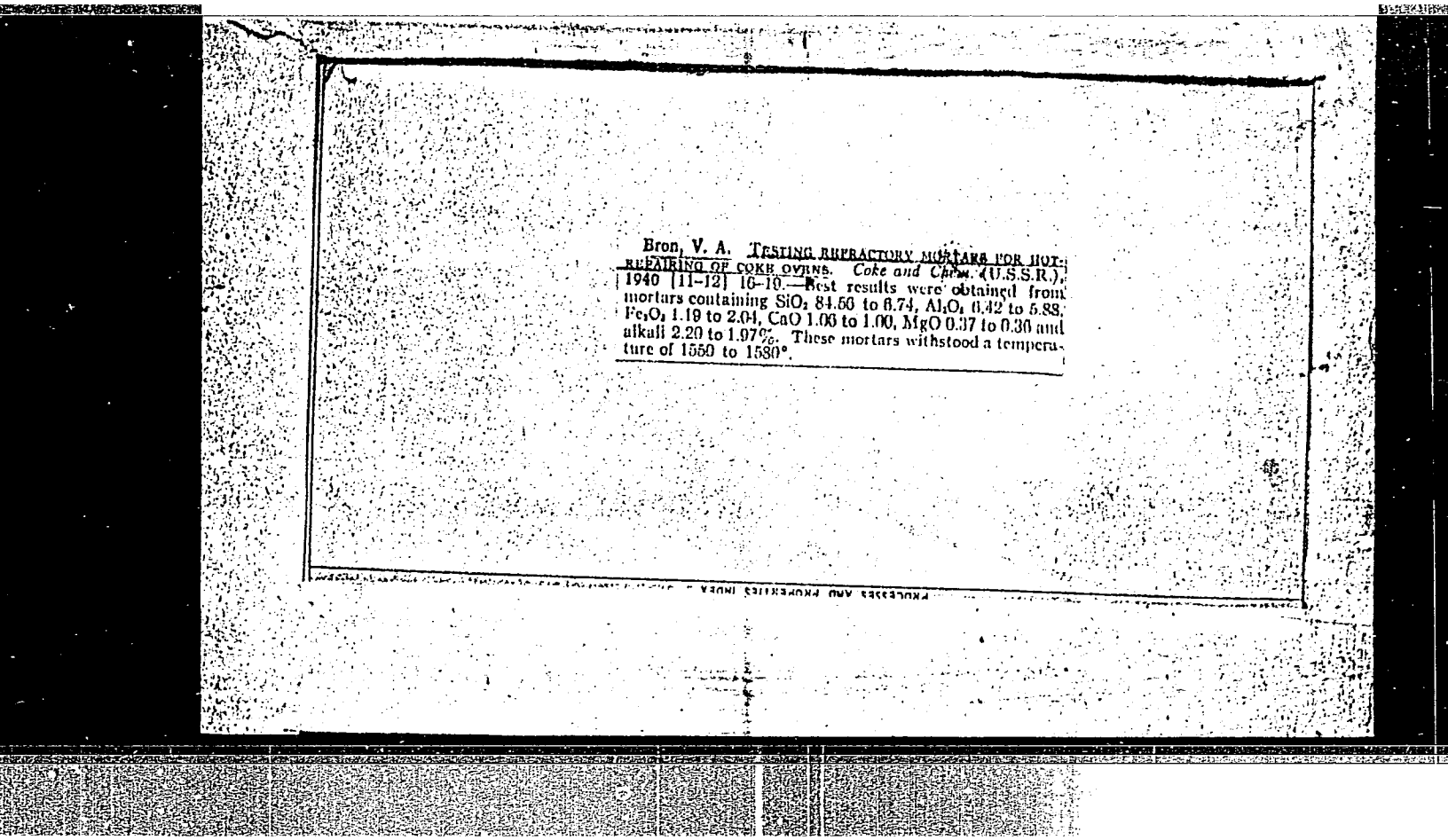
The effect of titanium dioxide on the properties of silica brick. V. A. Bron. *Ogneupory* 8, 210-14(1940).— When burnt, the TiO_2 in silica brick changes mostly to a glassy phase of a characteristic yellowish color. An addn. of 2% TiO_2 lowers the refractoriness only about 0.5 cone and with a simultaneous addn. of 0.5-1.5% Al_2O_3 or Fe_2O_3, about 1-2 cones. The deformation temp. is not affected by TiO_2 addns. under 3%.

B. E. Stefanowsky

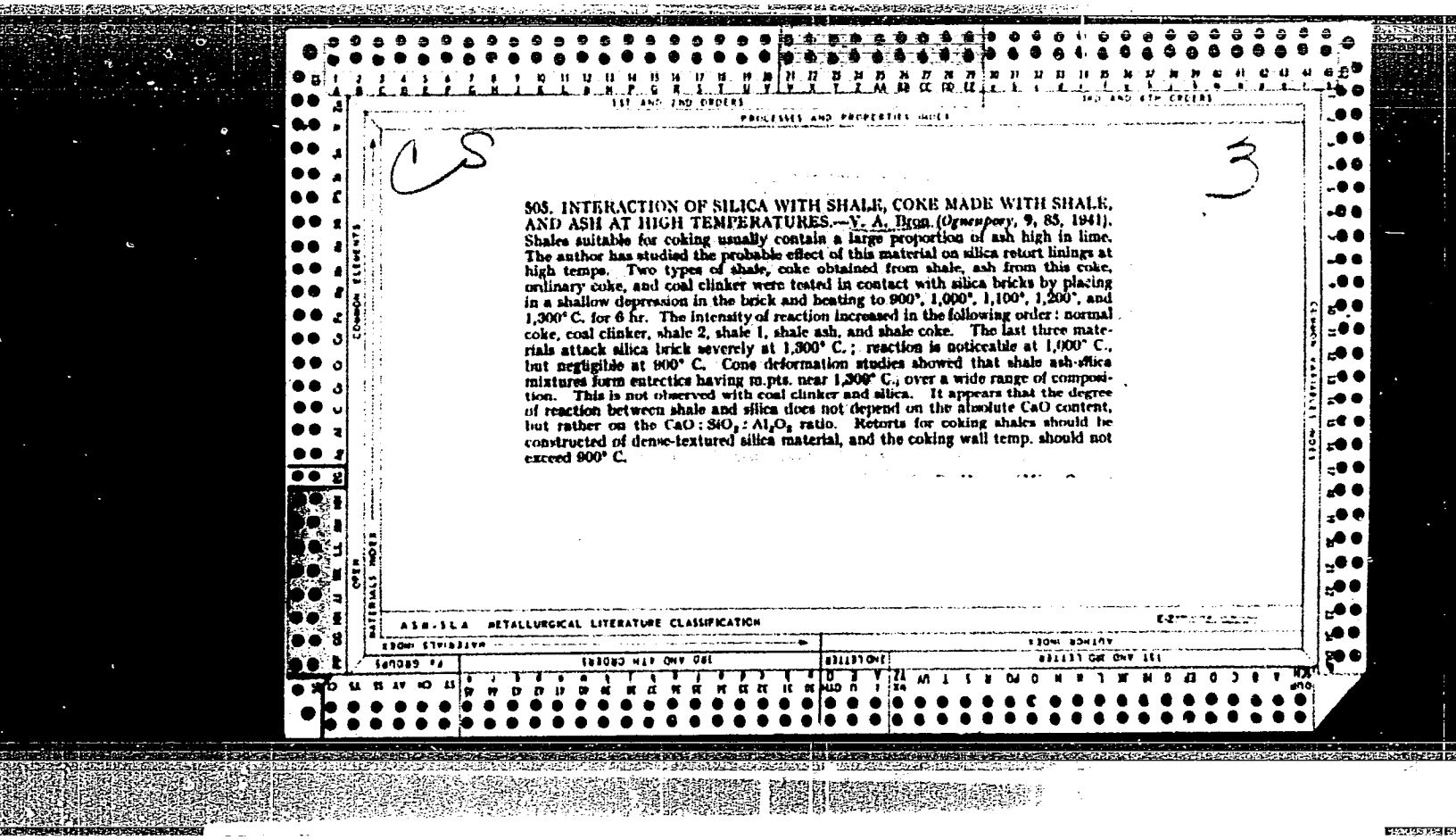
Bron, V. A. REFRACTORY MORTARS FOR COKE OVENS. *Ogneupory*, 8 [5-6] 247-61 (1940). Mortars of sufficient binding power for silica linings in all zones of cokes ovens were manufactured from Bilimbaevskii quartzites. The mortars are mixtures of powdered Bilimbaevskii quartzites, Tvolbanovskii clay, and fired silica with or without the admixture of dust-like quartz, chalk, and soluble glass, depending on the coke-oven zone in which the mortars are to be used.

Physicochemical properties of Dinas and mortars for lining furnaces of the Giprokoks system. V. A. BRON. *Koks & Khim.*, 1940, No. 10, pp. 29-32; *Khim. Referat. Zhur.*, 4 [4] 104 (1941).—B. found that the Dinas produced at the Lenin works has in many instances a lowered mechanical strength. The heat conductivity of the Dinas is satisfactory; the permeability to gases depends on the arrangements of the mortar joints. When the joints are perpendicular to the flow of gases, the permeability of the lining is lowered; their arrangement parallel to the flow increases the permeability. The expansion of the mortars is appreciably less than the expansion of the Dinas. Calcined mortar is more permeable to gases than uncalcined mortar. See "Refractory . . .," *Ceram. Abs.*, 21 [3] 62 (1942).

M.Ho.



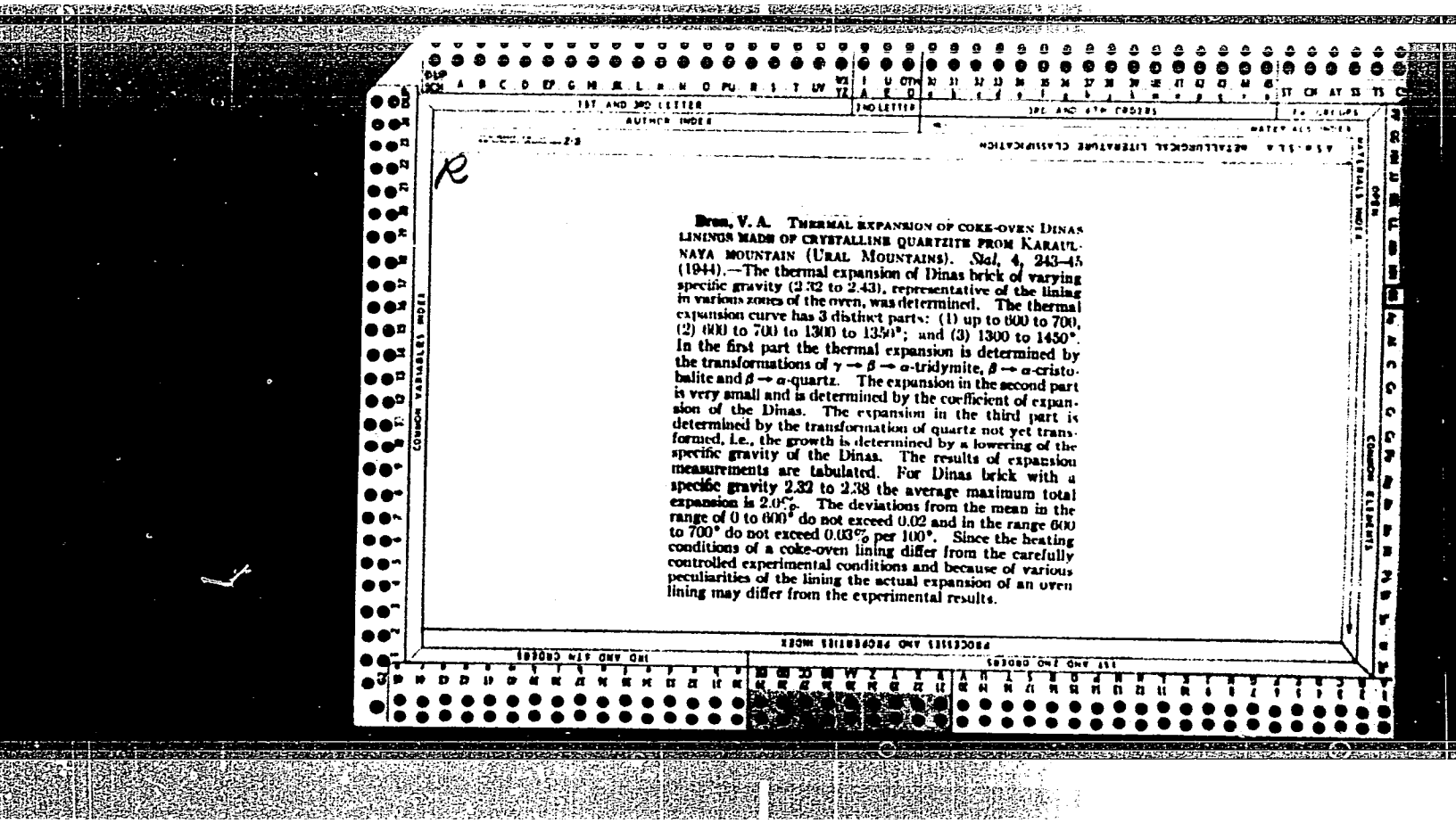
Bron, V. A. TESTING REFRACTORY MORTARS FOR HOT-REPAIRING OF COKE OVENS. *Coke and Chem.* (U.S.S.R.), 1940 [11–12] 16–19.—Best results were obtained from mortars containing SiO_2 84.56 to 6.74, Al_2O_3 6.42 to 5.88, Fe_2O_3 1.19 to 2.04, CaO 1.06 to 1.00, MgO 0.37 to 0.36 and alkali 2.20 to 1.97%. These mortars withstood a temperature of 1550 to 1580°.



505. INTERACTION OF SILICA WITH SHALE, COKE MADE WITH SHALE, AND ASH AT HIGH TEMPERATURES.—V. A. Bron. (*Ogneupory*, 9, 85, 1941). Shales suitable for coking usually contain a large proportion of ash high in lime. The author has studied the probable effect of this material on silica retort linings at high temps. Two types of shale, coke obtained from shale, ash from this coke, ordinary coke, and coal clinker were tested in contact with silica bricks by placing in a shallow depression in the brick and heating to 900°, 1,000°, 1,100°, 1,200°, and 1,300° C. for 6 hr. The intensity of reaction increased in the following order: normal coke, coal clinker, shale 2, shale 1, shale ash, and shale coke. The last three materials attack silica brick severely at 1,300° C.; reaction is noticeable at 1,000° C., but negligible at 900° C. Cone deformation studies showed that shale ash-silica mixtures form eutectics having m.pts. near 1,300° C., over a wide range of composition. This is not observed with coal clinker and silica. It appears that the degree of reaction between shale and silica does not depend on the absolute CaO content, but rather on the $CaO : SiO_2 : Al_2O_3$ ratio. Retorts for coking shales should be constructed of dense-textured silica material, and the coking wall temp. should not exceed 900° C.

BRON, V. A.

Bron, V. A. A NEW METHOD FOR THE DETERMINATION OF THE MOISTURE EVOLVED DURING THE SETTING OF REFRACTORY MORTARS. *Zavodskaya Lab.*, 10, 404–405 (1941). A weighed sample of mortar made up with a definite amount of water is placed in a vessel so constructed that the moisture evolved can be drawn off by the suction of a water pump. The method can be used only for lean mortars.



Bron, V. A. THERMAL EXPANSION OF COKE-OVEN DINAS LININGS MADE OF CRYSTALLINE QUARTZITE FROM KARAUL-NAYA MOUNTAIN (URAL MOUNTAINS). *Stal*, 4, 243–45 (1944).—The thermal expansion of Dinas brick of varying specific gravity (2.32 to 2.43), representative of the lining in various zones of the oven, was determined. The thermal expansion curve has 3 distinct parts: (1) up to 600 to 700, (2) 600 to 700 to 1300 to 1350°; and (3) 1300 to 1450°. In the first part the thermal expansion is determined by the transformations of $\gamma \rightarrow \beta \rightarrow \alpha$-tridymite, $\beta \rightarrow \alpha$-cristobalite and $\beta \rightarrow \alpha$-quartz. The expansion in the second part is very small and is determined by the coefficient of expansion of the Dinas. The expansion in the third part is determined by the transformation of quartz not yet transformed, i.e., the growth is determined by a lowering of the specific gravity of the Dinas. The results of expansion measurements are tabulated. For Dinas brick with a specific gravity 2.32 to 2.38 the average maximum total expansion is 2.0%. The deviations from the mean in the range of 0 to 600° do not exceed 0.02 and in the range 600 to 700° do not exceed 0.03% per 100°. Since the heating conditions of a coke-oven lining differ from the carefully controlled experimental conditions and because of various peculiarities of the lining the actual expansion of an oven lining may differ from the experimental results.

BRON, V. A.

Bron, V. A. Dinas from Bakal' quartzite. *Ogneupory*, 10 [46] 18-22 (1946).—The Bakal' quartzite deposit is one of the largest in the Urals. It was used by the metallurgical plants for the production of Dinas brick for open-hearth and electric steel-melting furnaces. Its performance was considered unsatisfactory because of its alleged low heat resistance. The quartzite appears as a predominantly gray mineral, and at times it has a pinkish or yellowish coloration. Ferruginous veins appear throughout the lumps. The lumps are coated with a thin brown film, and occasionally clayey substances appear on the surfaces. Pyritic occlusions are found in some of the lumps. Of the accompanying minerals, rutile, tourmaline, and apatite can be observed. Individual grains are held together by a cementing material comprising secondary quartz containing some limonite and occasionally particles of sericite. The grains are 0.1 to 1.0 mm. with a predominant fraction of 0.2 to 0.5 mm. It was thought that finer granulation of the quartzite might improve the heat resistance of the Dinas. Experimental batches of finer ground quartzite were prepared having the following composition:

Grain size (mm.)	Previous (%)	New (%)
5 to 4 } 4 to 3 }	12-20	0-4
3 to 0.5	28-30	28-40
Below 0.5	49-53	60-70
Below 0.088	Not determined	32-38

The brick was fired in two furnaces and yielded first-grade brick 78.0 to 85.2% and 0.0 to 1.0% underfired. This brick was tested in the arches of open-hearth furnaces and in electric steel-melting furnaces. One of the furnaces in which the experimental Dinas was used ran for 84 hot days during which 132 melts were produced totaling 7734 tons of steel. The electric furnace in which the Dinas was tested ran for 37 hot days and produced 90 melts totaling 1146 tons of steel. The average number of melts with the old-type Dinas was 60 for the same furnace. The finer ground quartzite satisfies the existing standards and is entirely suitable in arches of open-hearth and electrode furnaces.

AUTHOR INDEX MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Bron', V. A., and Bab'yas, I. P. Effect of grain-size distribution on the properties of Dinas made of Karaulnaya Mountain crystalline quartzites. *Ogneupory*, 11 [1] 17-24 (1946) — The crystalline quartzites of Karaulnaya Mountain were chosen for this work because their characteristics have been thoroughly studied and because they serve for the manufacture of most of the Dinas used in the Ural Mountain region. Grains vary from 0.05 to 0.2 mm. Accessory minerals are biotite, muscovite, pyrite, zircon, tourmaline, and brown hematite in very small amounts. Analysis shows SiO_2 97.78, Al_2O_3 + TiO_2 0.08, Fe_2O_3 0.53, CaO 0.20, MgO 0.09%, and loss on ignition 0.23%. Refractoriness is 1750°C. Specific gravity after firing is 2.51. Prior to firing, the water absorption, volume porosity, and bulk density were 0.1, 0.3, and 2.61 [illegible]; after firing, these were 1.3, 3.1, and 2.38%, respectively. Laboratory batches of definite grain-size distribution were made with a lime bond (2% CaO) and formed into 120 x [illegible] x 89 mm. briquettes using an Amsler press and a pressure of 1[illegible] kg./cm.^{2}. The briquettes were dried and then fired under conditions so that the products had different specific gravities ranging from 2.45 to 2.40 to 2.31 to 2.33. Studies were made of the compressive strength, change in porosity, and growth of Dinas as a function of specific gravity for various grain-size distributions. The direction of crystallization of the silica during firing was investigated with the aid of a Chevenard dilatometer. For a high degree of firing (specific gravity less than 2.35) the large grains of quartzite promote the crumbling of the Dinas whereas the small grains promote sintering. For a low degree of firing (specific gravity of 2.38 and higher) the crumbling action of the large grains was not obvious. The disperse fractions of the Dinas mass (less than 0.088 mm.) were the most active with regard to sintering; these also caused the greatest increase in mechanical strength and showed the greater relative drop in porosity (in comparison with the volume porosity of the unfired specimen). For Dinas of high specific gravity an increase in grain size causes an increase of residual quartz (with all conditions being the same); for Dinas of low specific gravity the large grains will direct the crystallization chiefly toward the formation of cristobalite, while the small grains will direct it toward the formation of tridymite. For Dinas made from crystalline quartzites it is possible to establish an optimum limit of grain size depending on the natural tendency of the quartzite to crumble. For these and similar quartzites the limit can be accepted as 4 mm. The Dinas should also have, however, about 35 to 45% of disperse fractions (less than 0.088 mm.) to insure good sintering and sufficiently high tridymitization. Additional growth of the Dinas can be reduced not only by reducing its specific gravity but also by using a finer grain-size distribution. Coke-oven Dinas should be made from fine quartzites which will increase the mechanical strength and reduce additional growth.

1ST AND 2ND ORDERS

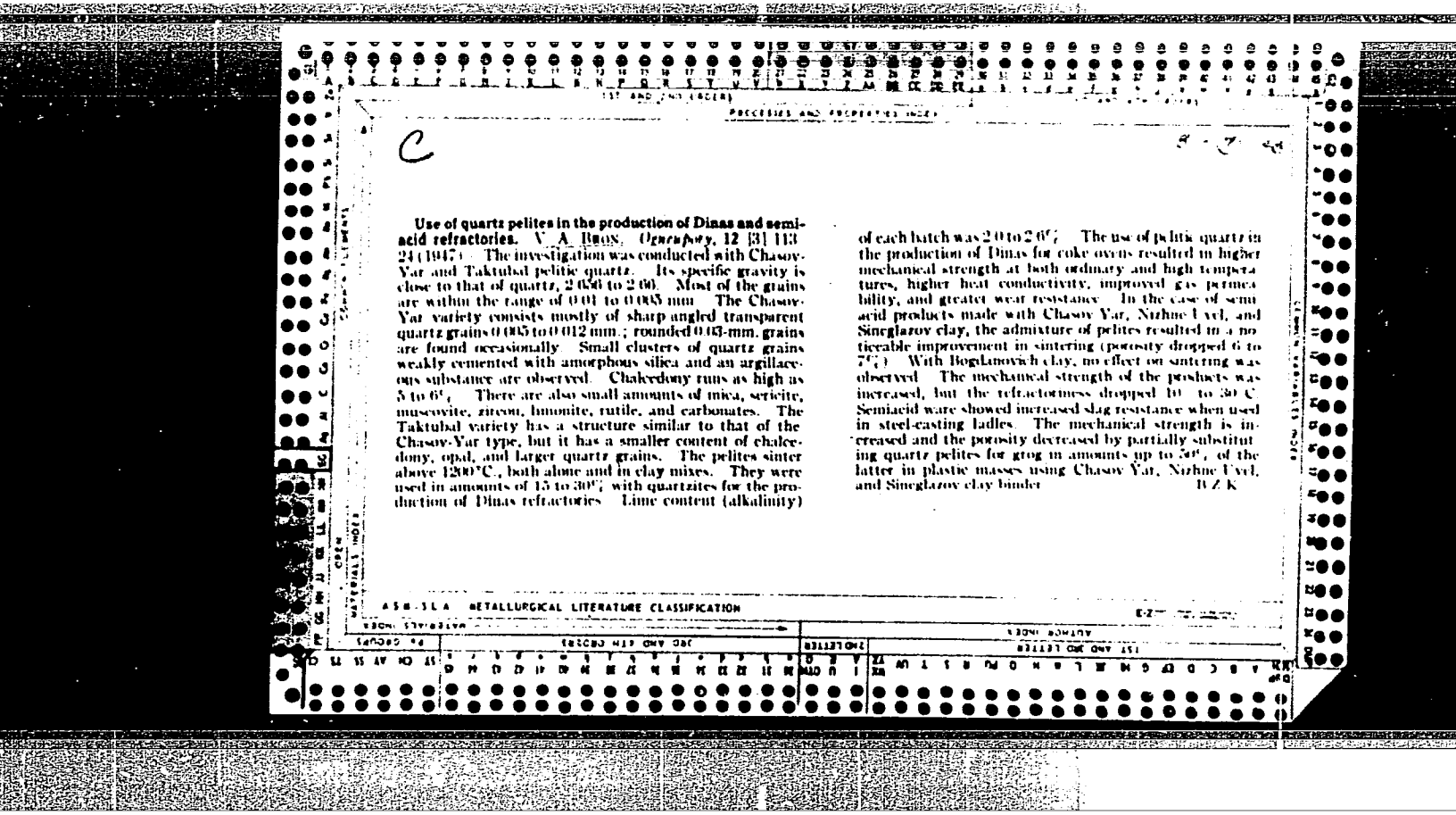
PROCESSES AND PROPERTIES INDEX

C

7-[illegible]-48

Dinas from quartzites of the Osokarovka deposits. V. A. Bron and T. S. Ionatova. *Ogneupory*, 12 [1] 27–34 (1947).—The quartzite deposits are situated about 5 km. northwest of Osokarovka station on the Karaganda-Petropavlovsk rail line. The microquartzites are in the form of dense quartz-chalcedony rock with a cryptocrystalline structure, consisting mainly of very fine grains of quartz which are cut by a net of quartz veins of larger grains. All the calcined samples could be separated into two distinct groups: those with considerable cracking and those with a dense structure. Brick made in the laboratory and in a pilot plant had shallow indentations which increased in number with increasing grain size. This defect was reduced considerably by the admixture of dross, which also reduced growth during firing and raised the mechanical strength. Maximum grain size should not exceed 3 to 4 mm. to reduce growth during firing and give increased compressive strength and porosity. Firing should be conducted within the interval of cones 138 to 141 (Seger cones 13 to 14). The quartzites should be washed free of the clay which is present. B.Z.K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



C

Use of quartz pelites in the production of Dinas and semi-acid refractories. V. A. Bron. *Ogneupory*, 12 [3] 113-24 (1947). The investigation was conducted with Chasov-Yar and Taktubal pelitic quartz. Its specific gravity is close to that of quartz, 2.650 to 2.60. Most of the grains are within the range of 0.01 to 0.005 mm. The Chasov-Yar variety consists mostly of sharp angled transparent quartz grains 0.005 to 0.012 mm.; rounded 0.03-mm. grains are found occasionally. Small clusters of quartz grains weakly cemented with amorphous silica and an argillaceous substance are observed. Chalcedony runs as high as 5 to 6%. There are also small amounts of mica, sericite, muscovite, zircon, limonite, rutile, and carbonates. The Taktubal variety has a structure similar to that of the Chasov-Yar type, but it has a smaller content of chalcedony, opal, and larger quartz grains. The pelites sinter above 1200°C., both alone and in clay mixes. They were used in amounts of 15 to 30% with quartzites for the production of Dinas refractories. Lime content (alkalinity) of each batch was 2.0 to 2.6%. The use of pelitic quartz in the production of Dinas for coke ovens resulted in higher mechanical strength at both ordinary and high temperatures, higher heat conductivity, improved gas permeability, and greater wear resistance. In the case of semi-acid products made with Chasov-Yar, Nizhne-Uvel, and Sineglazov clay, the admixture of pelites resulted in a noticeable improvement in sintering (porosity dropped 6 to 7%). With Bogdanovich clay, no effect on sintering was observed. The mechanical strength of the products was increased, but the refractoriness dropped 10 to 30° C. Semiacid ware showed increased slag resistance when used in steel-casting ladles. The mechanical strength is increased and the porosity decreased by partially substituting quartz pelites for grog in amounts up to 50%, of the latter in plastic masses using Chasov-Yar, Nizhne-Uvel, and Sineglazov clay binder. B Z K

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

9-7-51

Magnesia and magnesia-ferrous binder in Dinas. V. A. BRON. *Ogneupory*, 12 [9] 418-25 (1947).—Comparison of the CaO-FeO-SiO_2 and MgO-FeO-SiO_2 diagrams indicates that it is possible to raise the fire properties of Dinas in service by using an MgO binder instead of the ordinarily used lime. Dinas shapes were prepared with fine-ground (<0.08 mm.) metallurgical magnesite in amounts corresponding to the addition of 2% MgO. Characteristics of the Dinas were as follows: sp. gr. 2.37, volumetric porosity 22.4%, compressive strength 328 kg./cm.², refractoriness 1720°C., initial deformation under load of 2 kg./cm.² at 1670° and end at 1680°. The Dinas, however, had a tendency to form small cracks, its structure was sandy and not dense, fracture showed poor sintering, and the tridymite content did not exceed 20 to 25%; the quartz was changed chiefly into cristobalite, but some residual quartz in the form of cracked grains was also observed. This unsatisfactory structure was apparently connected with the insufficient amount of liquid phase which forms during the firing of Dinas made with magnesia binder. To remedy this, Dinas was prepared with magnesia-ferrous and magnesia-lime binders. Ratios of MgO/FeO were 5/1, 2/1, 1/1, 1/2, and 1/5, and MgO/CaO was 1/1. The amount of the MgO-FeO binder was 3% and of the MgO-CaO binder 2% by weight of dry quartzite powder. Changes in the ratio of MgO/FeO had no noticeable effect on specific gravity, porosity, compressive strength, and refractoriness, but the products differed in appearance and in extent of tridymitization. The tridymitization increased as the MgO/FeO decreased. The optimum ratio seemed to be 1/1 to 1/2; tridymitization was over 60%, with wedge-shaped crystals of 0.05 to 0.06 mm. Characteristics of this Dinas differed little from those of ordinary black Dinas or Dinas with a ferrous binder. The properties of Dinas with the magnesia-lime binder did not differ from those of Dinas with an ordinary lime binder. Dinas brick with all three types of binders were tested in a 5-ton open-hearth furnace for 268 heats. Examination of the brick indicated that wear occurred by the formation of the usual zonal structure. 4 photomicrographs. B.Z.K.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

USSR/Minerals
Clays, Aluminum-Containing
Ceramics

Nov 48

"The Use of Southern Ural Clay for the Manufacture of High-Alumina-Content Parts," V. A. Bron, Cand Tech Sci, D. P. Zegzhda, 9 pp

"Ogneupory" No 11, 483-492

Reports experiments. Discusses effect of mixture composition on agglomeration of parts, effect of paste treatment, effect of mineralizers, pastes containing aluminum by-products, and agglomeration of pastes, made from elutriated Yeleninsk kaolin. Includes 12 tables.

[redacted]

18/49T93

332. Problems relating to the life of silica brick in the roof of a basic open-hearth furnace. V. A. Bron (*Ogneupory*, 13, 105, 1948). It is considered that the following are the chief factors in determining the life of silica bricks in the roof of an open hearth furnace. During use, the lowering of the specific gravity of the silica brick made from crystalline quartzite results in better intercrystallization in the inner parts of the brick (e.g. in the black zone). Such a brick is less inclined to the formation of holes, therefore its abrasion will be retarded. The migration of the fluxes causes deterioration in the presence of too much coarse-grained silica, owing to the disintegration of the structure. During this fusion, ferrous oxide and alumina become concentrated in the grey zone, leading to a speeding up of the diffusion of the crystalline part of the bond in this zone; this causes fusion with consequent exposure of the coarse grains, which will then protrude from the working face of the silica brick. In fine-grained bricks, the process of the dissolving of silica and of the abrasion of the working face occurs more evenly. Special silica bricks

BRON, V. A.

FA 12/49T55

USSR/Engineering Jul 48
Refractories
Quartz

"Dinas From Quartz of the Grunchbulaksk, Narchinsk, Ashiyaksk Deposits," V. A. Bron, Cand Tech Sci, 6½ pp

"Ogneupory" Vol XIII, No 7 /361

The development of the metallurgical industry in the Uzbek SSR demands local manufactured refractories. Article describes examination of quartzites from three deposits in the southern part of Kazakh SSR. Results are tabulated and discussed.

12/49T55

Bron, V.A.

TRIDYMITE DINAS FROM VEIN QUARTZ. V. A. Bron
Ogneupory, 13 [9] 407-13 (1948).-- Experiments were conducted with vein quartz from the Chokadambulak deposits in the Uzbek S.S.R. The quartz is mostly cataclastic, with grains varying from micro to large size. There are indications of the deformation of some of the grains. The calcined material consisted mostly of metacristobalite, although some 0.01 to 0.03 mm. grains were observed. Dinas prepared from the quartz had over 90% tridymitization (on the basis of crystalline modifications). A characteristic of the Dinas was the formation of large tridymite crystals within the large grains of the mass, which is usually not found in Dinas. The size of the crystals reached 0.1 to 0.15 mm., and they formed a compact growth among themselves. The interval of deformation under load was 40° to 50°C., and deformation ended at 1690°C. The quartz merits investigation as a raw material in making Dinas for the arch in electric steel melting and open-hearth furnaces.

B.Z.K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BRON, V. A.

USSR/Engineering 11 Jan 1948
Furnaces
Refractory Materials

"Dinas in a Magnesium Band," V. A. Bron, 3 pp.

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 2
285-287

Study of dinas after use in furnace completing more than 268 runs shows that it has usual four-zone structure. However, following peculiarities of deterioration of the dinas noticed: a) Black zone brice as long as this zone in ordinary dinas develops. Indicates more energetic evacuation of fusion in the upper zone than in ordinary dinas, also confirming chemical composition and fire resistance of

USSR/Engineering (Cont'd) 11 Jan 1948

the zone. b) No blisters exist on the hot surface and trench, usually observed in ordinary dinas along the brick from the black zone to the gray zone, indicating lesser solubility of crystallic silica in the fusion. Submitted by Academician D. S. Belyankin, 12 Oct 1947.

4/17

BRON, V. A.

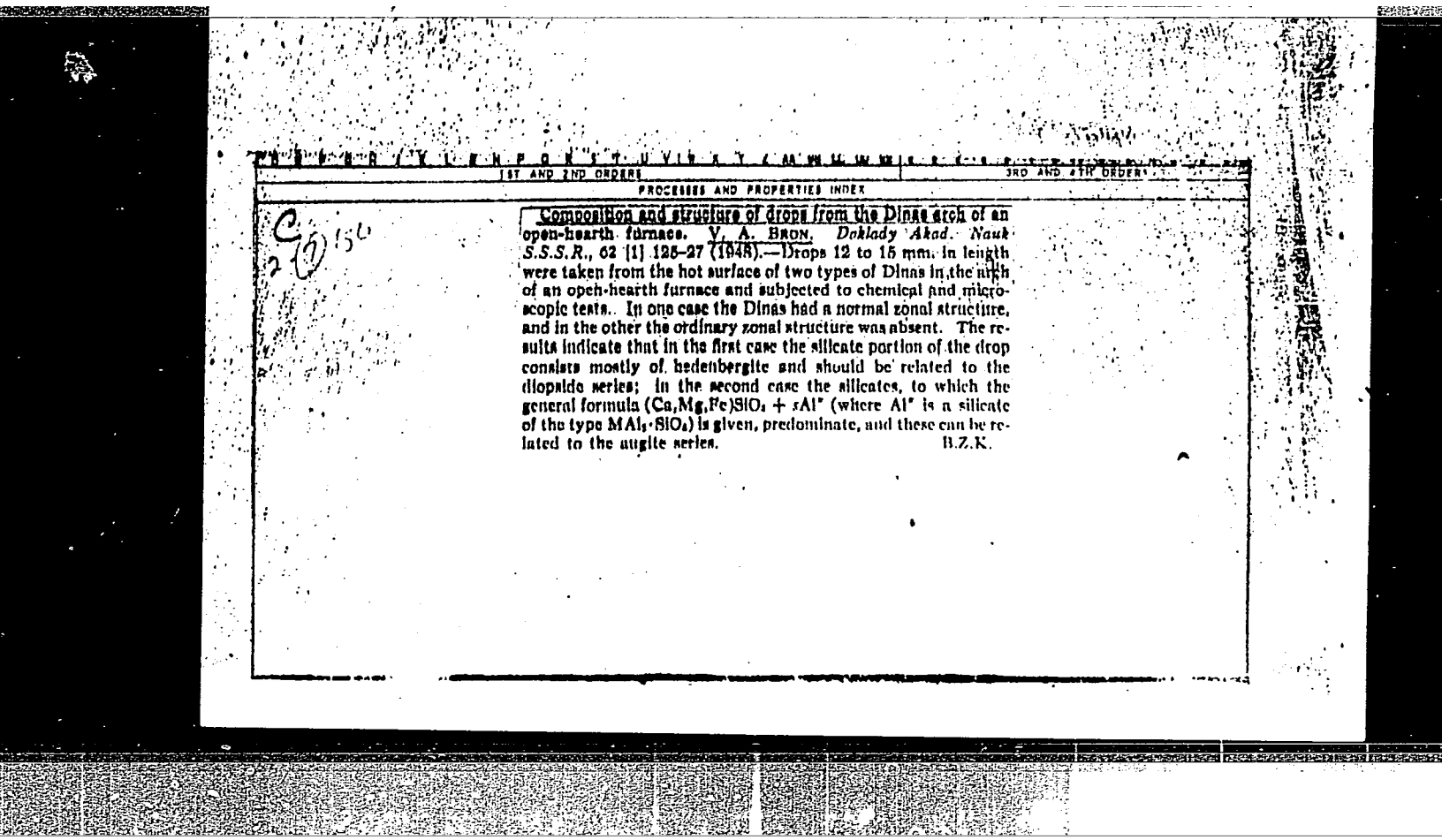
C

Cand Tech Sci -

Effect of liquid phase on the process of crystallization of silica. V. A. Bron. *Doklady Akad. Nauk S.S.S.R.*, 59 [3] 535-38 (1948). Various mineralizers were added to silica in amounts to give 10% melt at 1450°C., while mineralizers having a temperature of melt formation above 1450° were used for comparison. Calculation of mixtures was made from corresponding phase diagrams of the binary systems in the SiO_2 region of each diagram. Samples of the silica-mineralizer mixtures were fired at 1450°, after which the amount of tridymite and the size of its crystals were determined. The results show that the degree of tridymitization was determined not by the amount of the melt formed but by its melting temperature and consequently by its mobility at the maximum temperature of heating. This was true for the binary systems of SiO_2 and K_2O, Na_2O, MnO, FeO, BaO, CaO, MgO, and Al_2O_3; the system SiO_2–B_2O_3 was an exception. The anomaly of the system SiO_2–B_2O_3 may be due to its high glassforming capacity, which accounts for the poor crystallization of the melt. The temperature of melt formation for any mineralizer can be extended up to 1300° to 1350°, after which there is a rapid drop in tridymitization of the Dinas and a decrease in the size of the tridymite crystals.

B.Z.K.

Ural Affil, All-Union Sci-Res. Inst. Fire Resistant Materials



1ST AND 2ND ORDERS | 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

C 2 19 150

Composition and structure of drops from the Dinas arch of an open-hearth furnace. V. A. BRON. *Doklady Akad. Nauk S.S.S.R.*, 62 [1] 125–27 (1948).—Drops 12 to 15 mm. in length were taken from the hot surface of two types of Dinas in the arch of an open-hearth furnace and subjected to chemical and microscopic tests. In one case the Dinas had a normal zonal structure, and in the other the ordinary zonal structure was absent. The results indicate that in the first case the silicate portion of the drop consists mostly of hedenbergite and should be related to the diopside series; in the second case the silicates, to which the general formula $(Ca,Mg,Fe)SiO_3 + xAl''$ (where Al'' is a silicate of the type $MAl_2 \cdot SiO_4$) is given, predominate, and these can be related to the augite series. B.Z.K.

BRON, V. A.

PA 64/49T35

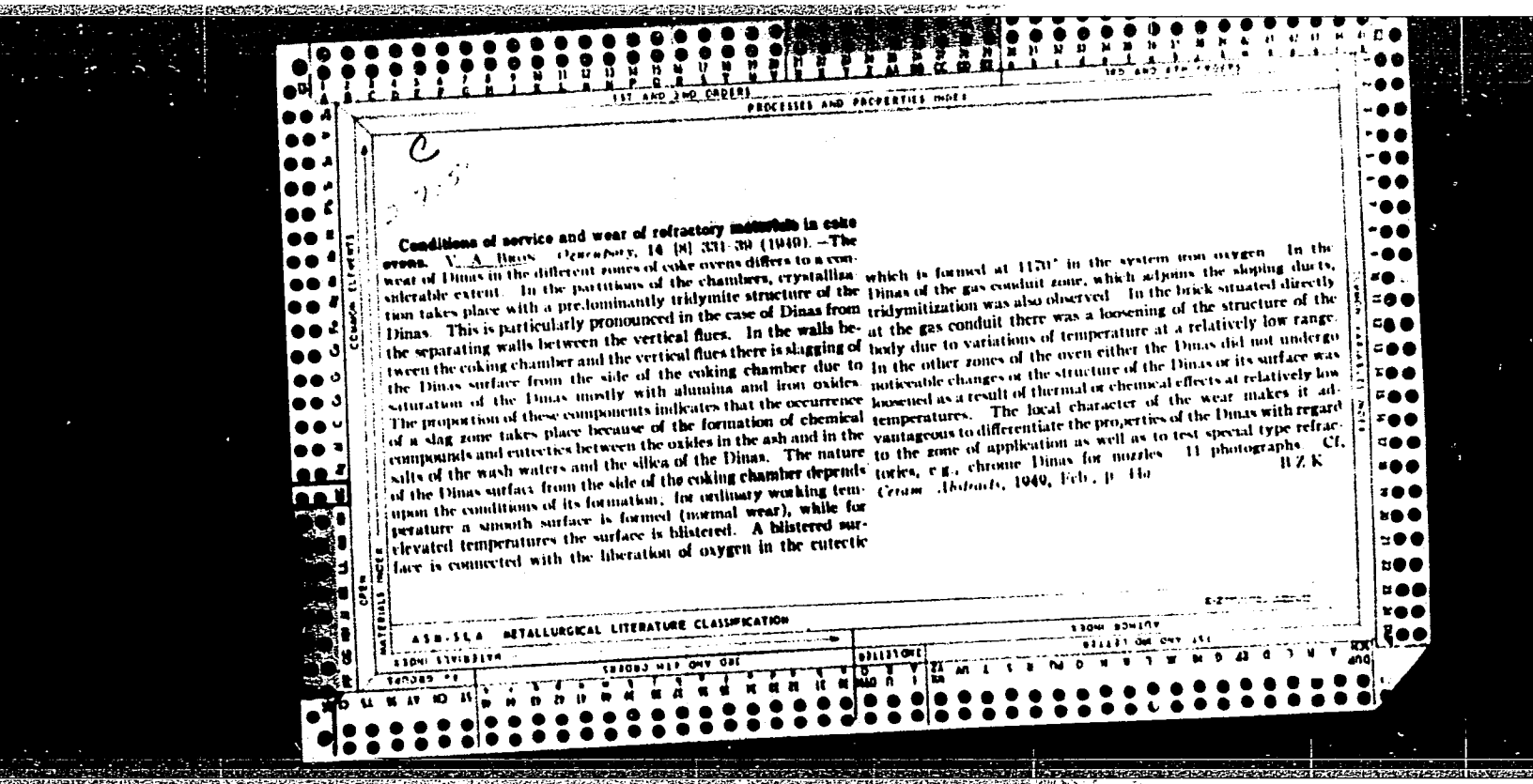
USSR/Engineering Aug 49
Refractory Materials
Furnaces - Refractory

"Conditions of Service and Wear of Refractory Materials in Coke Ovens," V. A. Bron, Cand Tech Sci, 9 pp

"Ogneupory" No 8

Discusses the wear of dinas in various parts of coke ovens. Concludes that it is advisable to use special refractories for certain parts of the oven lining. Lists properties of coking dinas which require improvement. Includes 11 illustrations and five tables.

64/49T35



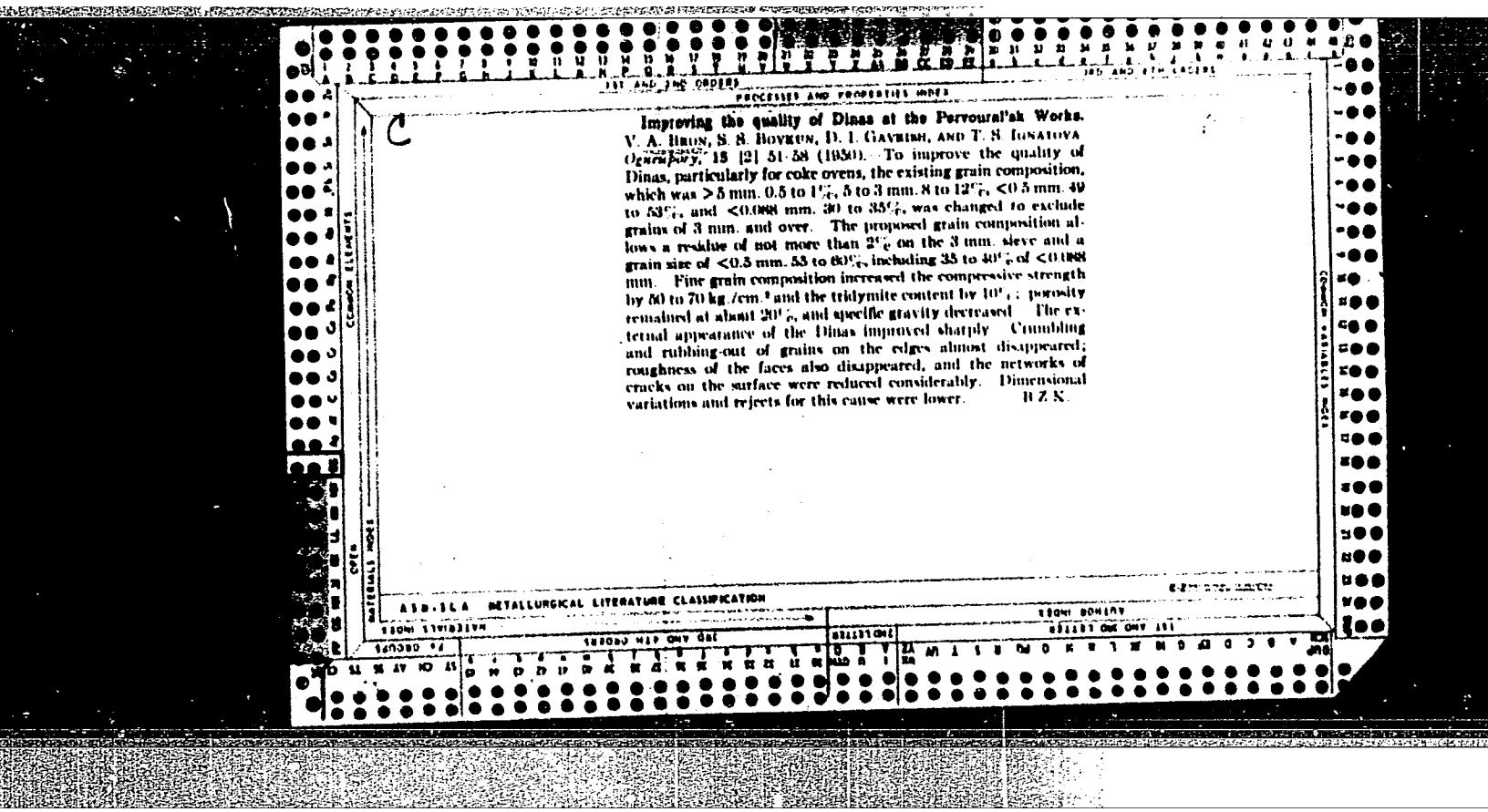
Conditions of service and wear of refractory materials in coke ovens. V. A. Bass. *Ogneupory*, 14 [8] 371–39 (1949). —The wear of Dinas in the different zones of coke ovens differs to a considerable extent. In the partitions of the chambers, crystallization takes place with a predominantly tridymite structure of the Dinas. This is particularly pronounced in the case of Dinas from the separating walls between the vertical flues. In the walls between the coking chamber and the vertical flues there is slagging of the Dinas surface from the side of the coking chamber due to saturation of the Dinas mostly with alumina and iron oxides. The proportion of these components indicates that the occurrence of a slag zone takes place because of the formation of chemical compounds and eutectics between the oxides in the ash and in the salts of the wash waters and the silica of the Dinas. The nature of the Dinas surface from the side of the coking chamber depends upon the conditions of its formation; for ordinary working temperature a smooth surface is formed (normal wear), while for elevated temperatures the surface is blistered. A blistered surface is connected with the liberation of oxygen in the eutectic which is formed at 1170° in the system iron oxygen. In the Dinas of the gas conduit zone, which adjoins the sloping ducts, tridymitization was also observed. In the brick situated directly at the gas conduit there was a loosening of the structure of the body due to variations of temperature at a relatively low range. In the other zones of the oven either the Dinas did not undergo noticeable changes or the structure of the Dinas or its surface was loosened as a result of thermal or chemical effects at relatively low temperatures. The local character of the wear makes it advantageous to differentiate the properties of the Dinas with regard to the zone of application as well as to test special type refractories, e.g., chrome Dinas for nozzles. 11 photographs. Cf. *Ceram. Abstracts*, 1949, Feb., p. Ha. B Z K

CA

19

Refractories for pitch coke ovens. V. A. Brun. Ogneu-
[illegible] 15, No. 1, 19-28(1950).—Dinas and fireclay brick were exaud. after 6-7 months' service. Wear of Dinas in partition walls of coking chambers differed from that in ordinary coke ovens. There was no "slag layer" on the coking side; instead, there was an accumulation of C to a depth of 30–40 mm. but this did not loosen the dense structure of the brick. The Dinas had a zonal structure; 6 zones were distinguished. Extent of SiO_2 transformation into tridymite was less than in ordinaty coke ovens and only in the 5th and 6th zones, near the vertical flue, was there intensive transformation as characterized by a sp. gr. of 2.32 or less. The nature of the surface indicates that wear was intensive; however, the resistance of Dinas was good. In the vertical and horizontal joints, particularly when thick, the cokrd pitch was deposited in a dense layer 5–6 mm. thick. The mortar from the chamber was also carbonized but it did not result in disintegration. Carbonization was not evident in the bottom but there was a loosening of the structure and fracturing. Neither the Dinas nor the fireclay brick were subjected during service to changes in the physicochem. properties which would account for their destruction. Rapid wear of the Dinas is caused by the deposits of pitch in the joints which, during the coking process, disrupts the brickwork; with fireclay brick, the deformation is caused also by shrinkage and disintegration in those sections which are not impregnated with the pitch. Quality of Dinas for use in such ovens can be improved by increasing the tridymitization; quality of fireclay brick can be improved by using multigrog mixes. This was confirmed by semicon. tests.

B. Z. K.



Improving the quality of Dinas at the Pervoural'sk Works. V. A. Ilkov, S. S. Bovkun, D. I. Gavrish, and T. S. Ignatova. *Ogneupory*, 15 [2] 51-58 (1950). To improve the quality of Dinas, particularly for coke ovens, the existing grain composition, which was >5 mm. 0.5 to 1%, 5 to 3 mm. 8 to 12%, <0.5 mm. 40 to 53%, and <0.088 mm. 30 to 35%, was changed to exclude grains of 3 mm. and over. The proposed grain composition allows a residue of not more than 2% on the 3 mm. sieve and a grain size of <0.5 mm. 55 to 60%, including 35 to 40% of <0.088 mm. Fine grain composition increased the compressive strength by 50 to 70 kg./cm.² and the tridymite content by 10%; porosity remained at about 20%, and specific gravity decreased. The external appearance of the Dinas improved sharply. Crumbling and rubbing-out of grains on the edges almost disappeared; roughness of the faces also disappeared, and the networks of cracks on the surface were reduced considerably. Dimensional variations and rejects for this cause were lower. B Z K.